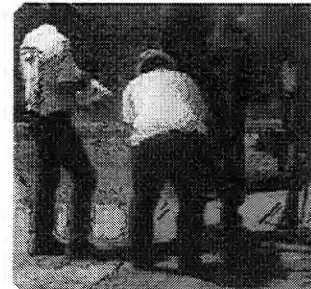
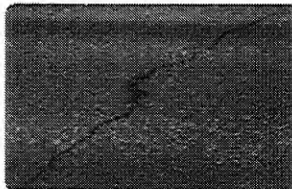
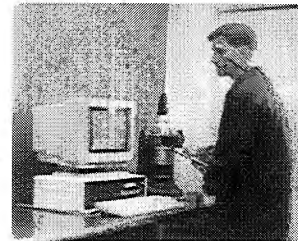
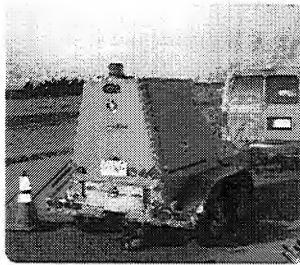
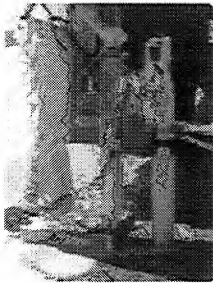


Montana Department of Transportation
Contract #HWY-306041-DT
Performance Prediction Models

Field Investigation Report



August 2002

MDT Highways and Engineering Division

"To survey, design, acquire the right-of-way, and construct safe, cost effective highway improvement projects in order to develop and maintain a cost effective, efficient, and safe transportation system."

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Appendix H	Roundup
Appendix I	Lavina
Appendix J	Geyser

FIELD INVESTIGATION REPORT

Introduction

The Montana Department of Transportation (MDOT) contracted Fugro-BRE to develop performance characteristics of flexible pavements in Montana and use these characteristics in the development of deterioration/performance models. A comprehensive performance monitoring and laboratory-testing program is currently underway to accomplish this objective.

Currently, ten additional sites in Montana have been added to the Long Term Pavement Performance (LTPP) sites from Montana and the surrounding States for this study. Field investigation work was required for these sites to develop a better understanding of the pavement layer structure and material properties.

Field Investigations

In April 2002, a team comprised of personnel from Fugro-BRE, Parsons Brinckerhoff (PB) and MDOT staff conducted field investigations on the ten additional Montana sites added to this study. The team consisted of Weng On Tam and Brian Killingsworth from Fugro-BRE; Brian Schlauch from PB; and Greg Zeihen, Dan Mayberry, Sam Mitchell, John Winfield and Ray Nydegger from MDOT.

A summary of the materials sampled can be found in the field reports for each site in Appendices A through J. Table 1 shows the testing schedule and Appendix location for the ten sites.

Table 1 Testing Schedule and Appendix Location of the Ten Additional Sites

Site	Roadway	Date	Appendix
Silver City	S-279	April 15, 2002	A
Beckhill/Deerlodge	I-90	April 16, 2002	B
Perma	S-382	April 17, 2002	C
Condon	P-83	April 18, 2002	D
Hammond	N-23	April 23, 2002	E
Wolf Point	P-25	April 24, 2002	F
Fort Belknap	P-1	April 25, 2002	G
Roundup	N/P-14	April 30, 2002	H
Lavina	N/P-14	May 1, 2002	I
Geyser	P-57	May 2, 2002	J

Twenty-foot bores were conducted to determine the layer thickness information as well as to check for the presence of a shallow rigid layer that may affect the backcalculated

pavement moduli. Two ten-inch diameter asphalt concrete cores were taken to determine mix design properties from the asphalt concrete mixture. These include the air void content, gradation, and asphalt binder viscosity. Twelve six-inch asphalt concrete cores were taken to determine material properties for use in performance prediction.

To characterize the underlying layers, cores of the cement-treated bases were taken to determine their properties (compressive strength and elastic modulus), and samples of the unbound layers were taken to determine their resilient modulus and moisture content.

Laboratory Materials Testing

Laboratory materials tests will be performed to measure the properties needed for the distress prediction models. Testing on the samples recovered from the field investigation will be conducted at Fugro and AAT (Advanced Asphalt Technologies). AAT will conduct the mixture performance tests in their laboratory in Sterling, Virginia. Fugro will conduct all the other tests in the laboratories in Austin and Houston, Texas. Table 2 shows the testing schedule for materials from the ten sites.

Annual Monitoring Program

The annual monitoring program will be consistent with the Long Term Pavement Performance (LTPP) program except a higher frequency of data collection will be implemented for this project. The annual monitoring project will include Falling-Weight Deflectometer (FWD) tests, condition surveys to identify and measure the types and extents of distress at the site, ride quality, and rut depths (determined by transverse profiles).

Deflection Testing. The first round of deflection testing was conducted in October 2001 and the second round in April 2002. A summary of the deflections measured for each site during the first round of testing can be found in the appendices. The project team is processing deflections from the second round of testing. With pavement layer thicknesses determined from the field investigation in April 2002, Fugro-BRE will use backcalculation procedures to determine the pavement layer moduli for the test sections.

Profile Testing. The first round of profile testing was conducted in October 2001. The resulting International Roughness Indices (IRI) for each of the sections are summarized in the appendices.

Manual Distress Surveys for each of the sites were conducted using the LTPP Distress Identification Manual. Several of the sites had chip seals and showed relatively little distress.

Table 2 Laboratory Materials Testing Plan for the Ten Additional Sites

Materials Test	10 to 12-inch Cores	4 to 6-inch Cores	Cement Treated Base	Aggregate Base & Subbase	Subgrade Soil
Rice or Maximum Specific Gravity	√ - 2				
Bulk Specific Gravity		√ - 12			
Extract Asphalt	√ - 2				
Gradation of HMA	√ ⁽¹⁾				
Viscosity	√ ⁽²⁾				
Repeated Load Resilient Modulus		√ ⁽³⁾		√ ⁽⁵⁾	√ ⁽⁵⁾
Indirect Tensile Strength & Failure Strain		√ ⁽³⁾			
Creep Compliance		√ ⁽⁴⁾			
Compressive Strength			√ - 4		
Elastic Modulus			√ - 4		
Moisture Contents					√ - 2 Borings
<p>⁽¹⁾ The gradation of the HMA mixtures is only needed for those projects where the construction files do not have this information. If the gradation is available, gradation tests do not need to be performed.</p> <p>⁽²⁾ The viscosity is to be performed on the extracted asphalt at three temperatures – 275, 140, and 70.</p> <p>⁽³⁾ The resilient modulus is to be measured on specific cores and then followed by the indirect tensile strength test. Six cores (3 from the wheel path area and 3 from the between wheel path area) will be tested. Two cores will be tested at 40, two at 60, and two at 80 °F. The LTPP protocols for the resilient modulus and indirect tensile strength testing will be followed.</p> <p>⁽⁴⁾ The creep compliance testing for low temperature characterization will be conducted on 6 cores. Two cores will be tested at a –20, two at –10, and two at 0 °C, in accordance with the LTPP test protocols. The creep compliance tests will be followed by the indirect tensile strength test at each temperature in accordance with the LTPP protocol.</p> <p>⁽⁵⁾ Two test specimens will be compacted and tested from each site for the aggregate base materials and subgrade soils. These repeated load resilient modulus tests will be performed in accordance with the LTPP test protocols.</p>					

Summary

This report compiles the field investigation work conducted by the project team in April 2002 as well as the raw data collected from the first round of manual distress surveys, deflection testing, and profile testing. The appendices contain the field data collected from each of the ten sites. Each appendix contains the location, pavement structure, summary of materials sampled, bore logs, distress survey maps and summary, FWD deflections, and profile data for one site.

The materials testing plan is being finalized, and preparations for testing the samples are underway. Quality control checks are being conducted on the manual distress surveys, FWD deflections, profile data, and any necessary post-processing is underway. All the results from the materials testing and annual surveys will be used in the local calibration of the 2002 Guide models for Montana.

APPENDIX A

SILVER CITY

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Silver City
Longitude: 112°11' W
Latitude: 46°45' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	5.1	4.7	4.9	Chip Seal
2	Base	7.0	7.0	7.0	Dark Brown Sandy Clay
3	Subgrade	-	-	-	Gravelly Clay

Materials Sampling

Date: 4/15/02

Material Type	Quantity	Comments
ACP	14 cores	2-10" & 12-6" cores
Base	2 bags	2 additional bags
Subgrade	7 bags	1 split spoon

SHRP REGION _____

FIELD MATERIAL SAMPLING

STATE MT

AND FIELD TESTING

SHRP ASSIGNED ID _____

LTPP EXPERIMENT Silver Creek

ROUTE/HIGHWAY S-279

Lane _____

Direction WB

SAMPLE/TEST: (a) Before Section V#1

(b) After Section _____

FIELD SET NO. _____

6" Asphalt

LOG OF SHOULDER PROBE

DCG SHEET: 08

OPERATOR Dan / Sam

EQUIPMENT USED _____

SHEET NUMBER 1 OF 1

AUGERING DATE 4-15-02

LOCATION STATION: RA-9

AUGER PROBE NUMBER _____

TOP OF ROCK BASED ON: _____

OFFSET: _____

feet from ^{o/s}

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1		7" brn base course	
2			
3	3.0'	dk brn cly some fine gravel Subgrade	
4		lt brn gravelly cly	
5			
6			
7			
8			
9			
10			
11		coarse ls gravel	
12			
13		lt brn gravelly cly	
14			
15			
16		coarse ls gravel	
17		lt brn gravelly cly	
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): N

DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
Crew Chief, Contractor
Affiliation: MOT

VERIFIED AND APPROVED

SHRP Representative
Affiliation: _____

MONTH-DAY-YEAR
_____-_____-19_____
Date

SHRP REGION
STATE MT

FIELD MATERIAL SAMPLING
AND FIELD TESTING

SHRP ASSIGNED ID
Lane Direction WB

LTPP EXPERIMENT Silver City (W) ROUTE/HIGHWAY 5-279
SAMPLE/TEST: (a) Before Section (b) After Section #2

FIELD SET NO.
DCG SHEET: 08

OPERATOR Don M. EQUIPMENT USED

SHEET NUMBER 1 OF 1
AUGER PROBE NUMBER

AUGERING DATE 4-15-02 LOCATION STATION:
TOP OF ROCK BASED ON: OFFSET: feet from °/s

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	.7*	Base Course LT brn sandy gravel	
2		Subgrade dk brn: sandy clay	
3	2.5		
4		lt tan brn gravelly clay	
5			
6	5.5		
7			
8		lt brn clayey gravel	
9			
10	10.0		
11		coarse LS & shale gravel	
12	15.0		
13		org brn gravelly clay	
14			
15			
16	15.0		
17		coarse LS & shale gravel w/clay	
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
Crew Chief, Contractor
Affiliation: MDT

VERIFIED AND APPROVED

SHRP Representative
Affiliation: _____

MONTH-DAY-YEAR
_____-_____-19
Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Silver City
 Longitude: 112°11' W
 Latitude: 46°45' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/15/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH
CRACKING			
1 FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2 BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3 EDGE CRACKING (METERS)	0.0	0.0	0.0
4 LONGITUDINAL CRACKING			
4a. Wheelpath (Meters)	0.0	0.0	0.0
Length Sealed (Meters)	0.0	0.0	0.0
4b. Non-Wheelpath (Meters)	0.0	0.0	0.0
Length Sealed (Meters)	0.0	0.0	0.0
5 REFLECTION CRACKING AT JOINTS	Not Recorded		
6 TRANSVERSE CRACKING			
Number of Cracks	0	0	0
Length (Meters)	0.0	0.0	0.0
Length Sealed	0.0	0.0	0.0
PATCHING AND POTHOLES			
7 PATCH / PATCH DETERIORATION			
(Number)	0	0	0
(Square Meters)	0.0	0.0	0.0
8 Potholes			
(Number)	0	0	0
(Square Meters)	0.0	0.0	0.0

Location: Silver City
 Longitude: 112°11' W
 Latitude: 46°45' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/15/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE _____ SEVERITY LEVEL _____
 _____ N/A _____

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10 SHOving
 (Number)
 (Square Meters)

SURFACE DEFECTS

11 BLEEDING
 (Square Meters)

12 POLISHED AGGREGATE
 (Square Meters)

13 RAVELING
 (Square Meters)

MISCELLANEOUS DISTRESSES

14 LANE-TO-SHOULDER DROPOFF - Not Recorded

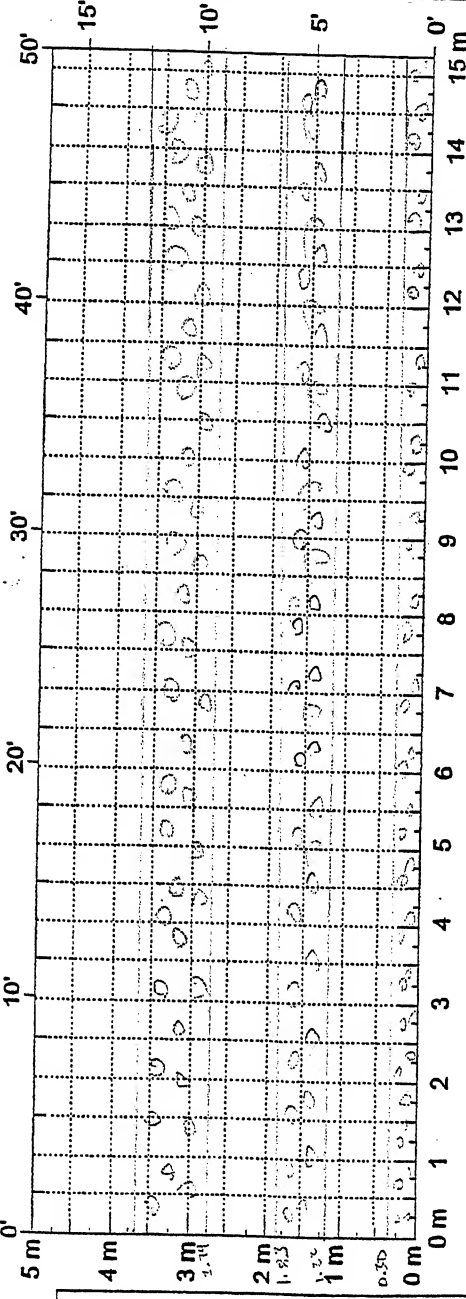
15 WATER BLEEDING AND PUMPING
 (Number)
 Length of Affected Pavement
 (Meters)

16 OTHER (Describe) Recently chip sealed. Raveling of chip seal is
the only distress.

11111111

State Assigned ID _____
State Code _____
SHRP Section ID _____

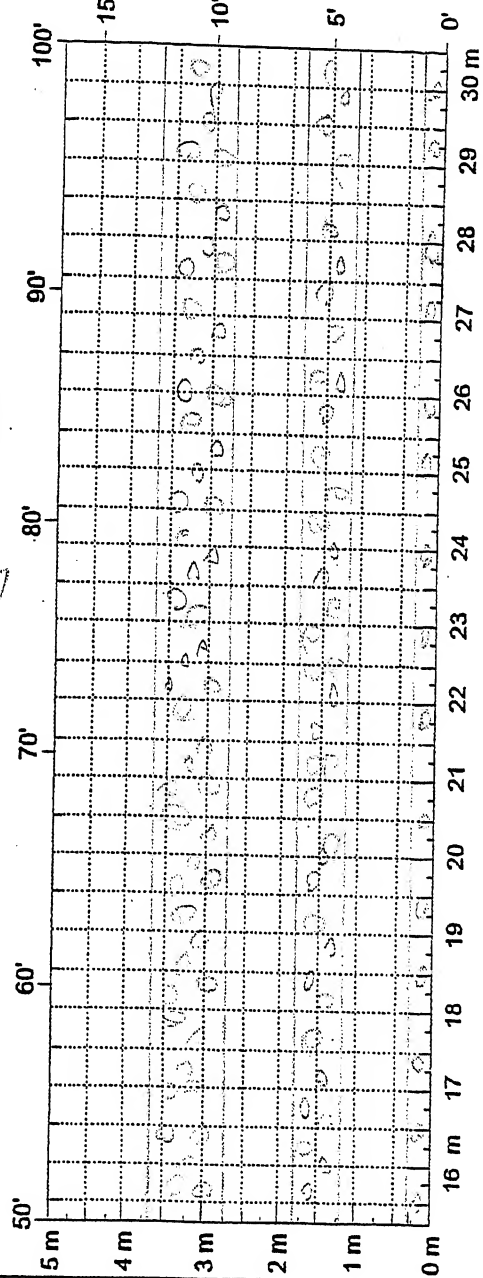
Surveyors: AT/BR
Date: 4/15/02
Pavement Temp: _____
Before _____ After _____



Section Summary

131 0.30 x 101.19 +
0.51 x 102.47 +
0.91 x 152.14
= 237.46 m

Comments: *Entire section was recently chip sealed



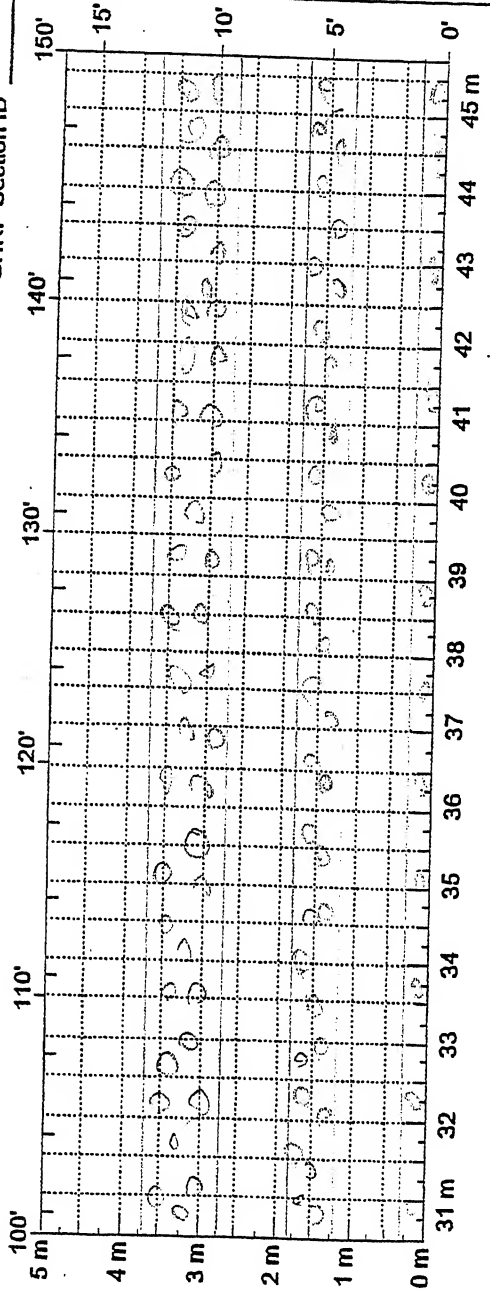
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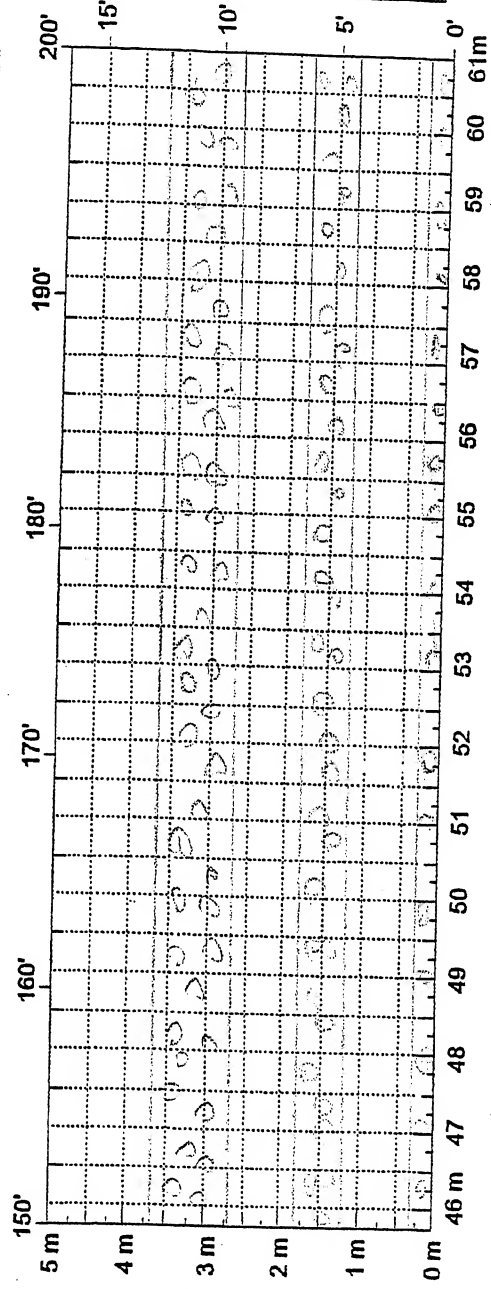
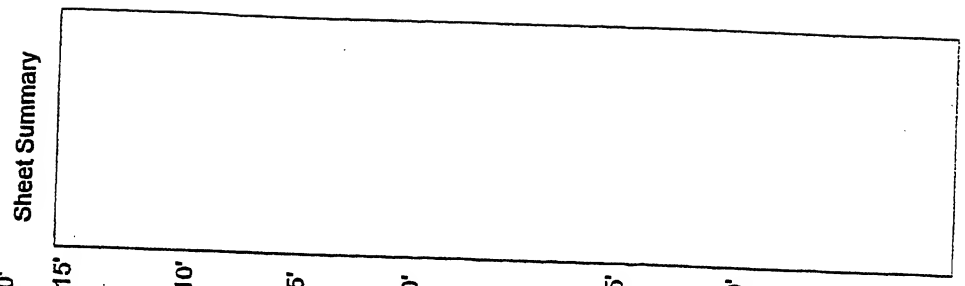
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____

Surveyors: WJ/BK
 Date: 4/15/02



Comments: _____



Comments: _____

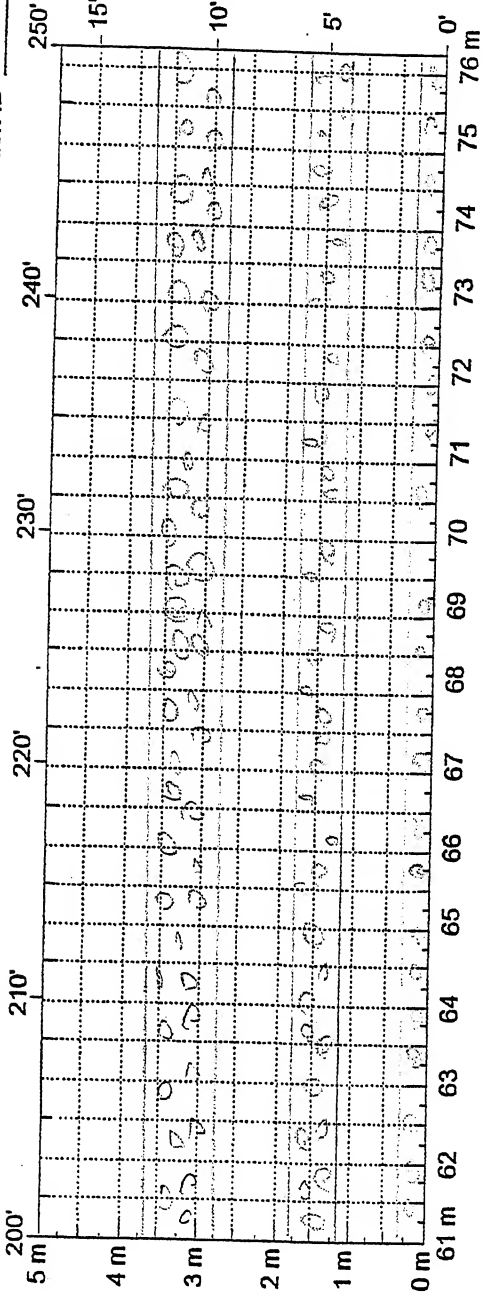
Reviewer: _____

State Assigned ID _____

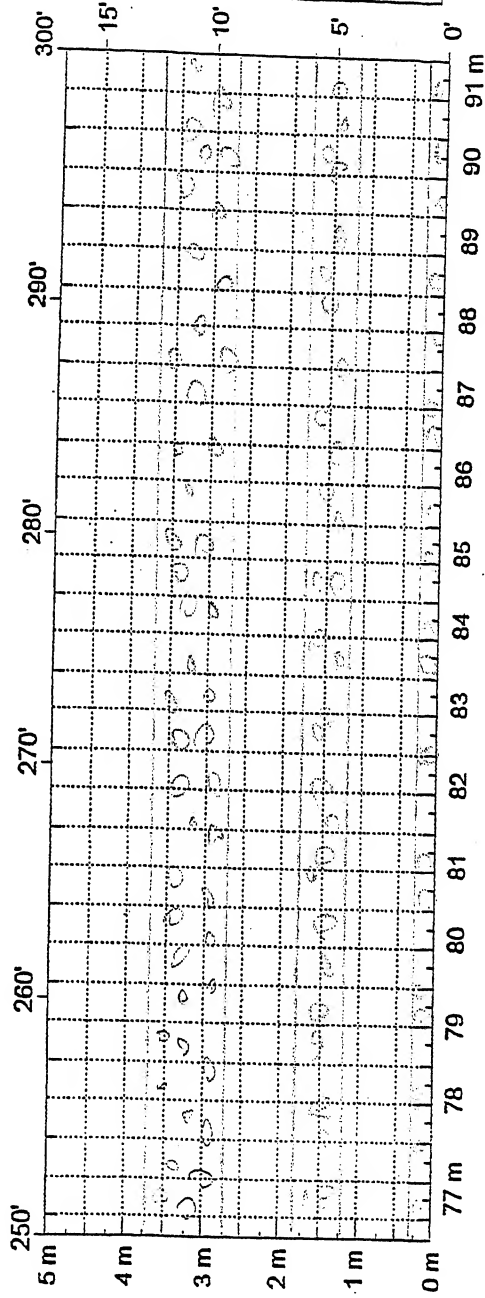
Date: 4/15/02

State Code _____

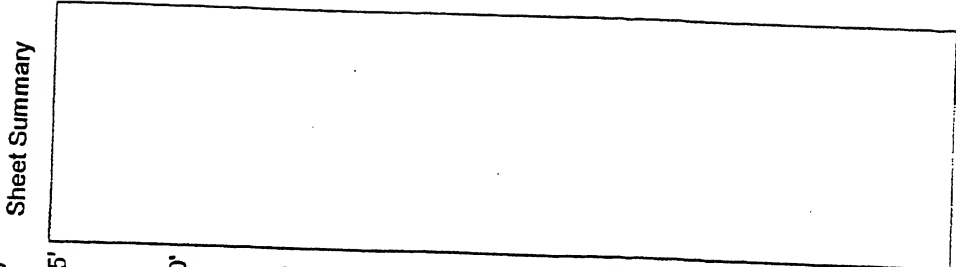
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Comments: _____



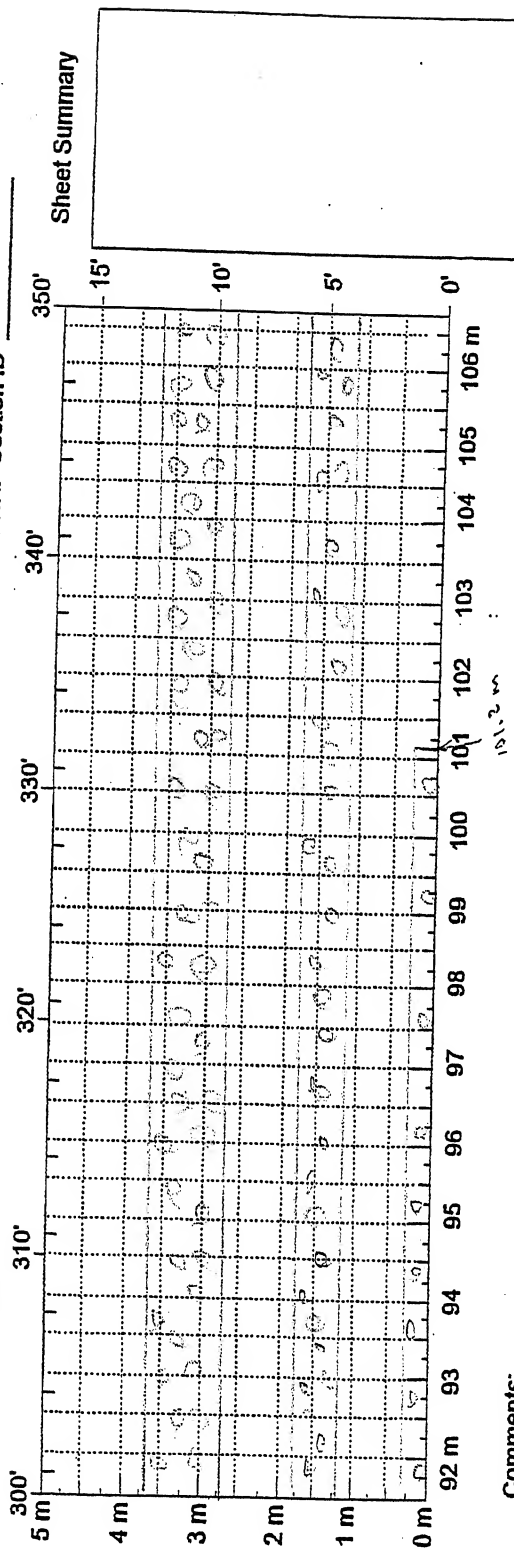
Comments: _____



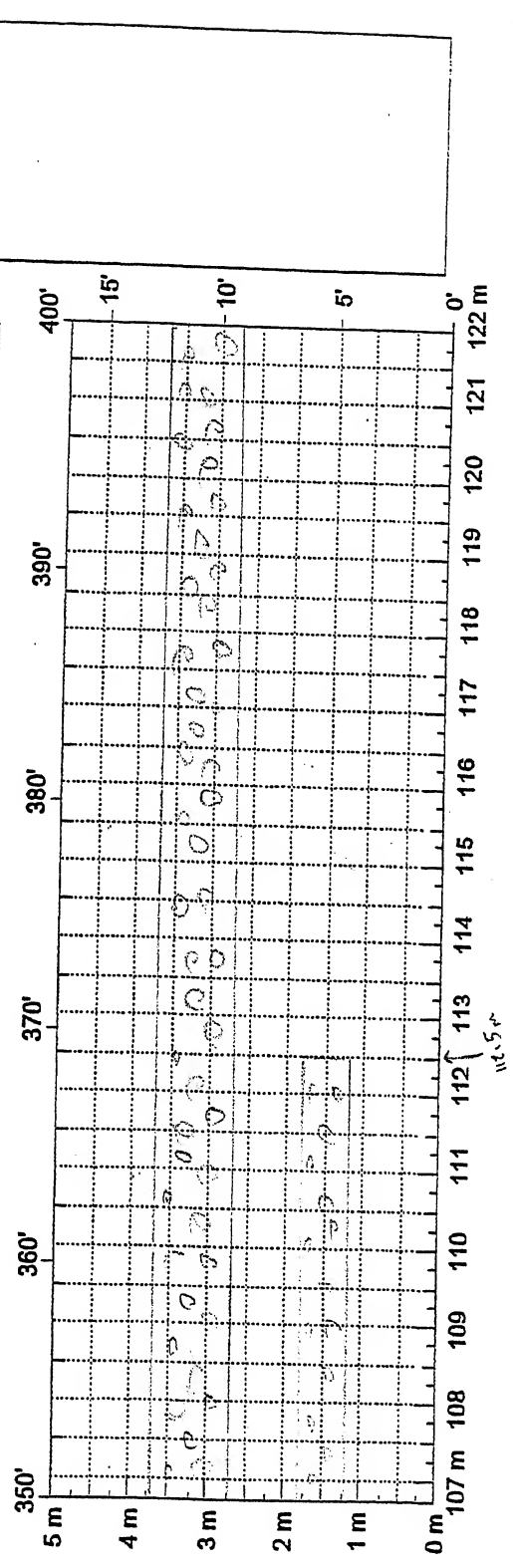
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____

Surveyors: WT/BSK
 Date: 4/15/02

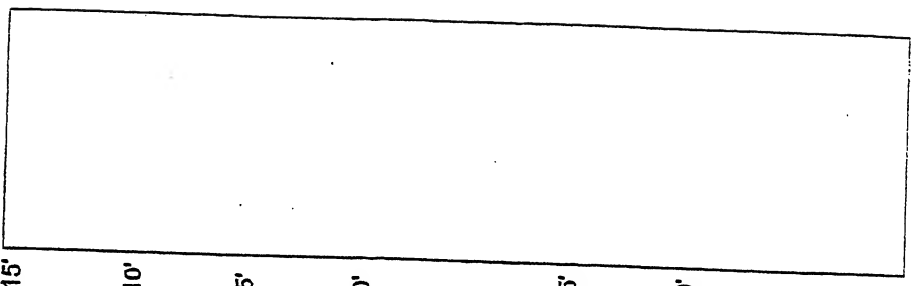


Comments: _____



Comments: _____

Sheet Summary



State Assigned ID _____

State Code _____

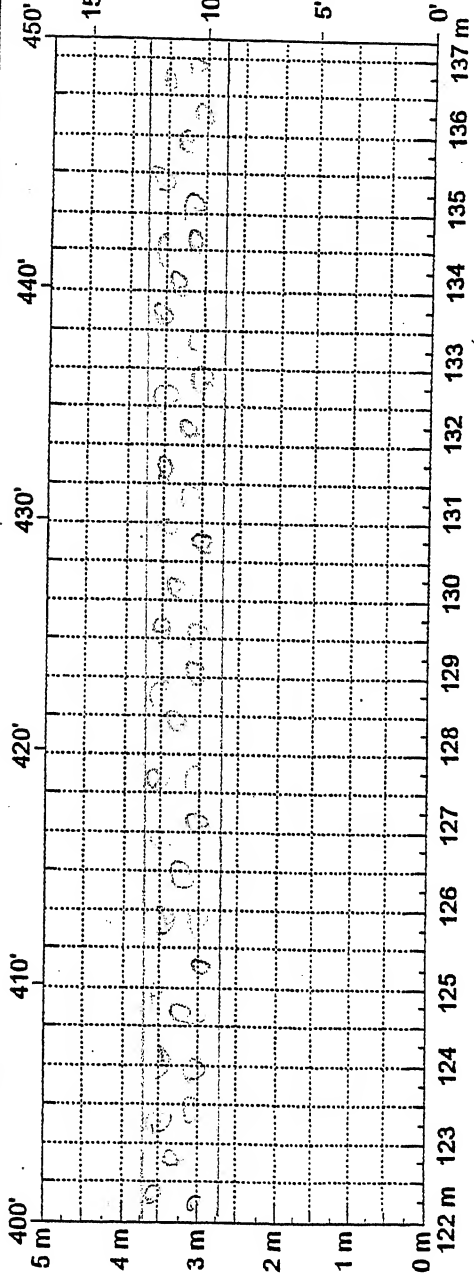
SHRP Section ID _____

Pavement Temp: _____

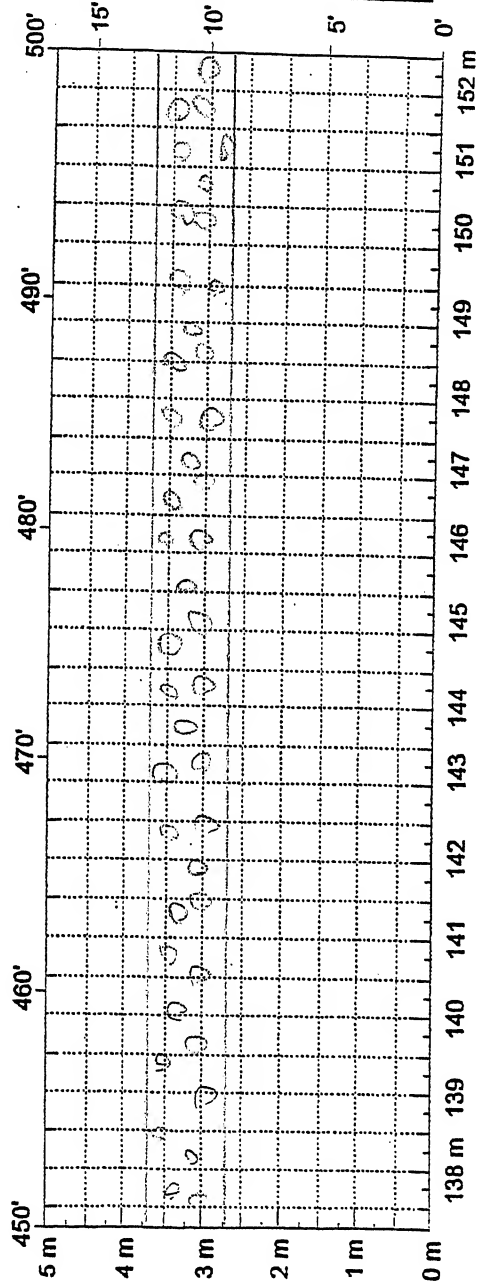
After _____

Reviewers: 12/1/02

Date: 4/15/02

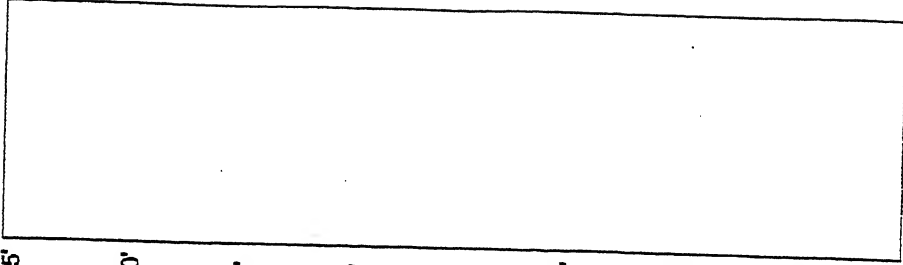


Comments: _____



Comments: _____

Sheet Summary



**Montana Performance Prediction Models Contract
Field Data Report**

Location: Silver City
 Longitude: 112°11' W
 Latitude: 46°45' N

FWD Data

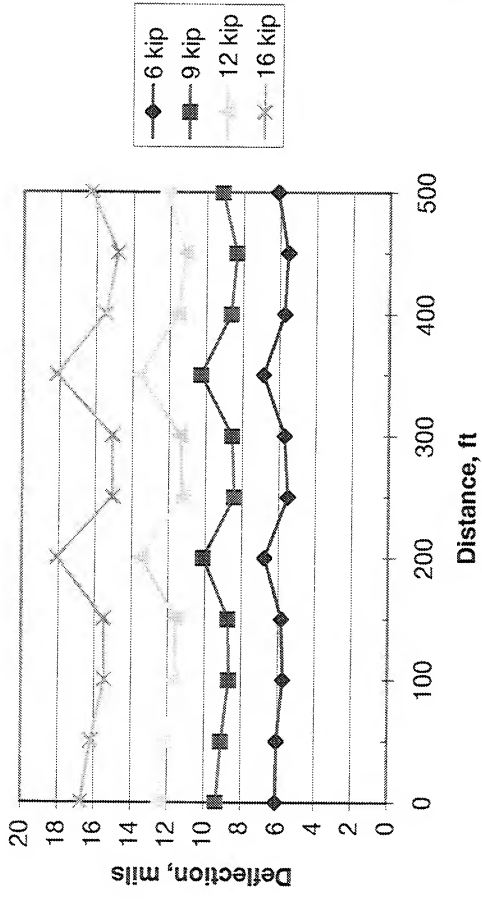
Test Date: 10/7/01

Layer	Material Type	Average Thickness in.
1	ACP	4.9
2	Base	7.0
3	Subgrade	-

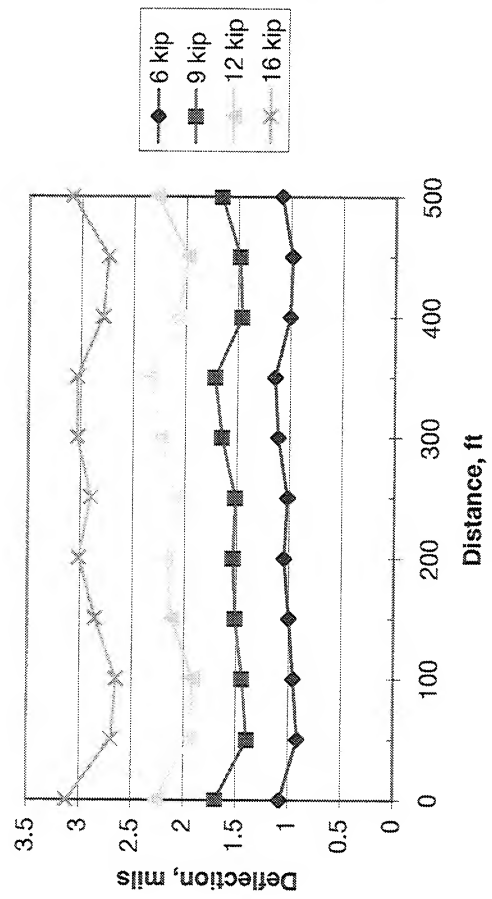
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
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0+00	9.63	9.98	8.44	7.19	5.66	4.39	2.73	1.81
0+00	12.07	12.50	10.63	9.12	7.20	5.59	3.48	2.27
0+00	15.49	16.19	13.59	11.68	9.29	7.22	4.48	3.02
0+50	7.02	7.08	5.74	4.76	3.59	2.70	1.64	1.07
0+50	9.61	9.69	7.96	6.64	5.01	3.78	2.28	1.49
0+50	12.00	12.12	9.95	8.37	6.39	4.80	2.93	1.94
0+50	15.40	15.57	12.86	10.84	8.32	6.25	3.83	2.59
1+00	6.96	6.64	5.39	4.50	3.46	2.60	1.62	1.11
1+00	9.54	9.18	7.54	6.32	4.84	3.65	2.27	1.53
1+00	11.96	11.54	9.45	7.98	6.19	4.65	2.95	1.91
1+00	15.34	14.81	12.23	10.34	8.07	6.12	3.80	2.54
1+50	6.95	6.72	5.51	4.64	3.62	2.76	1.70	1.16
1+50	9.65	9.35	7.79	6.56	5.12	3.94	2.50	1.62
1+50	11.88	11.45	9.66	8.14	6.36	4.95	3.10	2.10
1+50	15.36	14.89	12.47	10.61	8.30	6.49	4.09	2.74
2+00	6.98	7.86	6.50	5.39	4.04	3.02	1.81	1.22
2+00	9.55	10.71	9.02	7.46	5.69	4.24	2.55	1.63
2+00	11.91	13.42	11.30	9.44	7.14	5.40	3.26	2.14
2+00	15.41	17.41	14.69	12.32	9.41	7.13	4.34	2.90
2+50	6.95	6.37	5.21	4.42	3.48	2.66	1.72	1.18
2+50	9.50	8.89	7.35	6.24	4.89	3.77	2.38	1.60
2+50	12.08	11.33	9.41	8.00	6.35	4.87	3.14	2.10
2+50	15.45	14.53	12.20	10.38	8.24	6.32	4.03	2.80

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	6.96	6.60	5.41	4.58	3.62	2.77	1.76	1.29
3+00	9.53	9.06	7.59	6.37	5.00	3.89	2.54	1.74
3+00	12.07	11.43	9.57	8.16	6.39	4.98	3.21	2.24
3+00	15.42	14.54	12.21	10.47	8.28	6.44	4.17	2.92
3+50	6.97	7.96	6.19	5.06	3.75	2.88	1.81	1.33
3+50	9.50	10.85	8.66	7.06	5.24	4.01	2.53	1.81
3+50	12.00	13.61	11.01	8.98	6.72	5.14	3.25	2.33
3+50	15.56	17.63	14.21	11.56	8.82	6.77	4.33	2.95
4+00	6.94	6.62	5.40	4.53	3.51	2.68	1.68	1.16
4+00	9.54	9.16	7.60	6.31	4.89	3.78	2.40	1.55
4+00	11.99	11.51	9.57	8.05	6.33	4.78	3.04	2.07
4+00	15.31	14.84	12.26	10.36	8.14	6.23	4.03	2.67
4+50	7.00	6.46	5.29	4.47	3.47	2.65	1.68	1.15
4+50	9.53	8.84	7.39	6.25	4.81	3.70	2.31	1.57
4+50	11.99	11.11	9.36	7.86	6.17	4.73	3.04	1.98
4+50	15.41	14.28	12.12	10.21	8.05	6.17	3.90	2.64
5+00	6.95	7.08	5.82	4.88	3.75	2.91	1.86	1.26
5+00	9.60	9.75	8.21	6.86	5.28	4.12	2.63	1.77
5+00	11.93	12.08	10.12	8.55	6.64	5.19	3.32	2.26
5+00	15.30	15.57	12.92	10.98	8.68	6.72	4.24	2.95

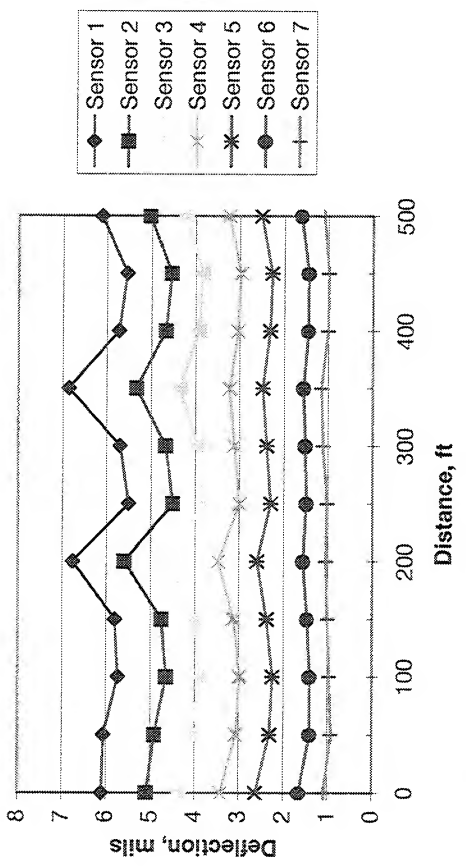
Silver City, Sensor 1 Deflections



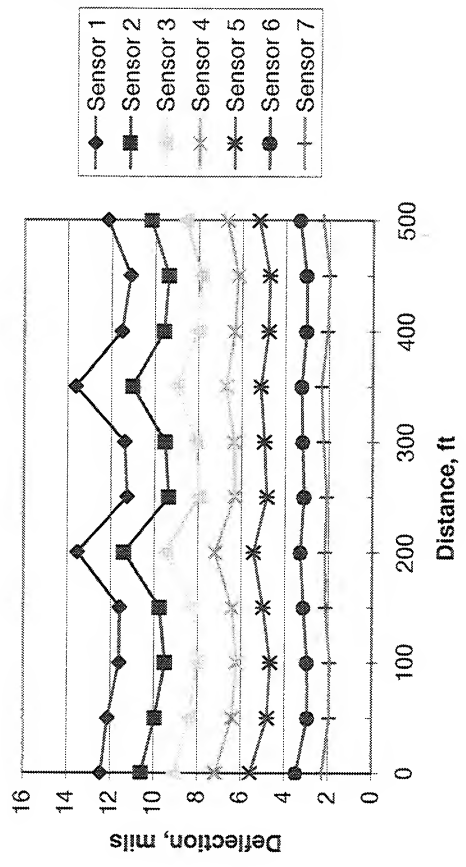
Silver City, Sensor 7 Deflections



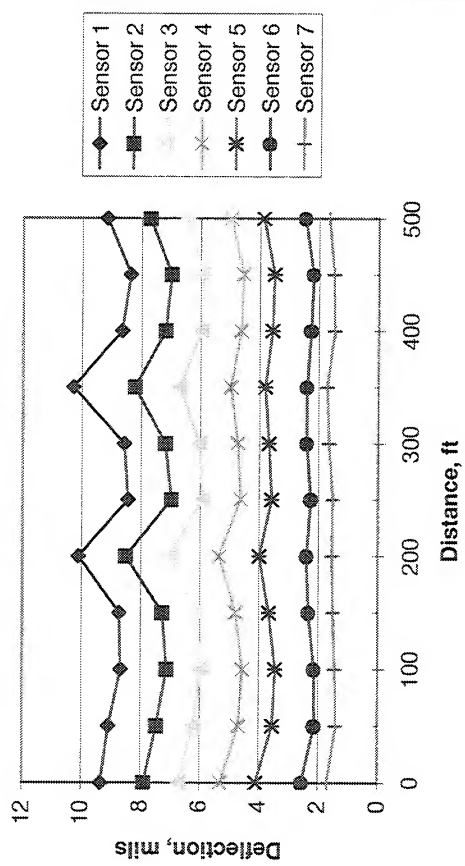
Silver City, 6,000-lb Load



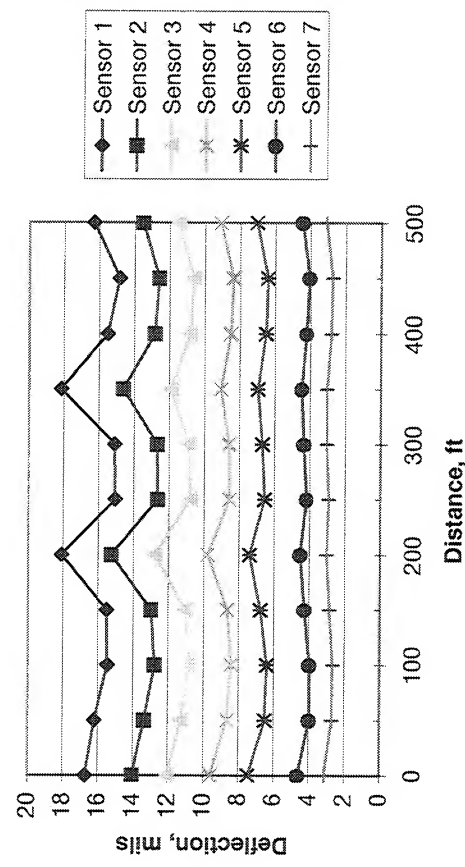
Silver City, 12,000-lb Load



Silver City, 9,000-lb Load



Silver City, 16,000-lb Load



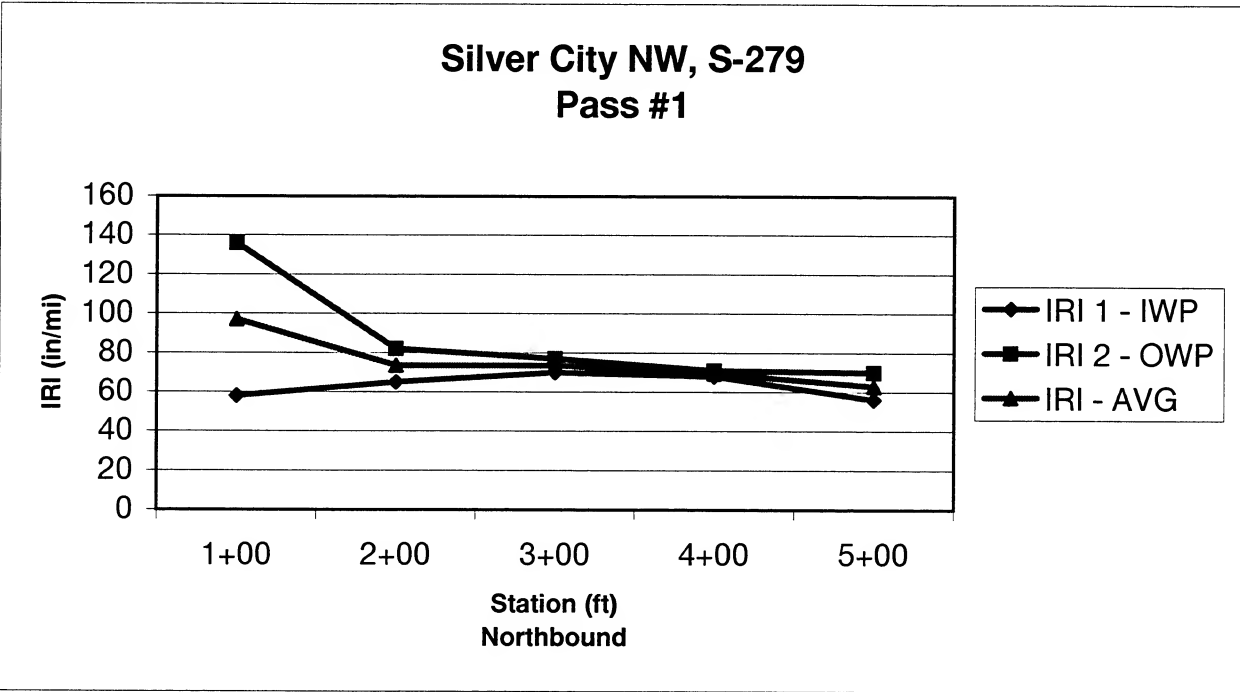
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Silver City
 Longitude: 112°11' W
 Latitude: 46°45' N

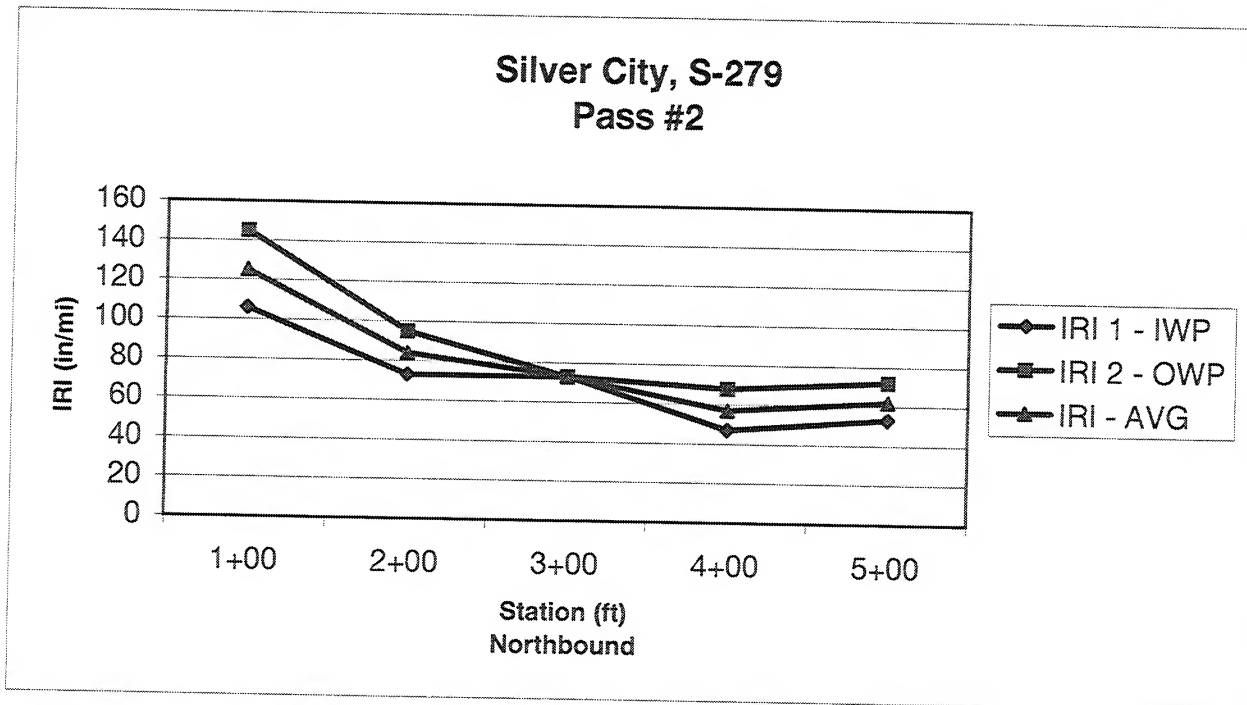
Profile Data

Test Date: 10/16/01

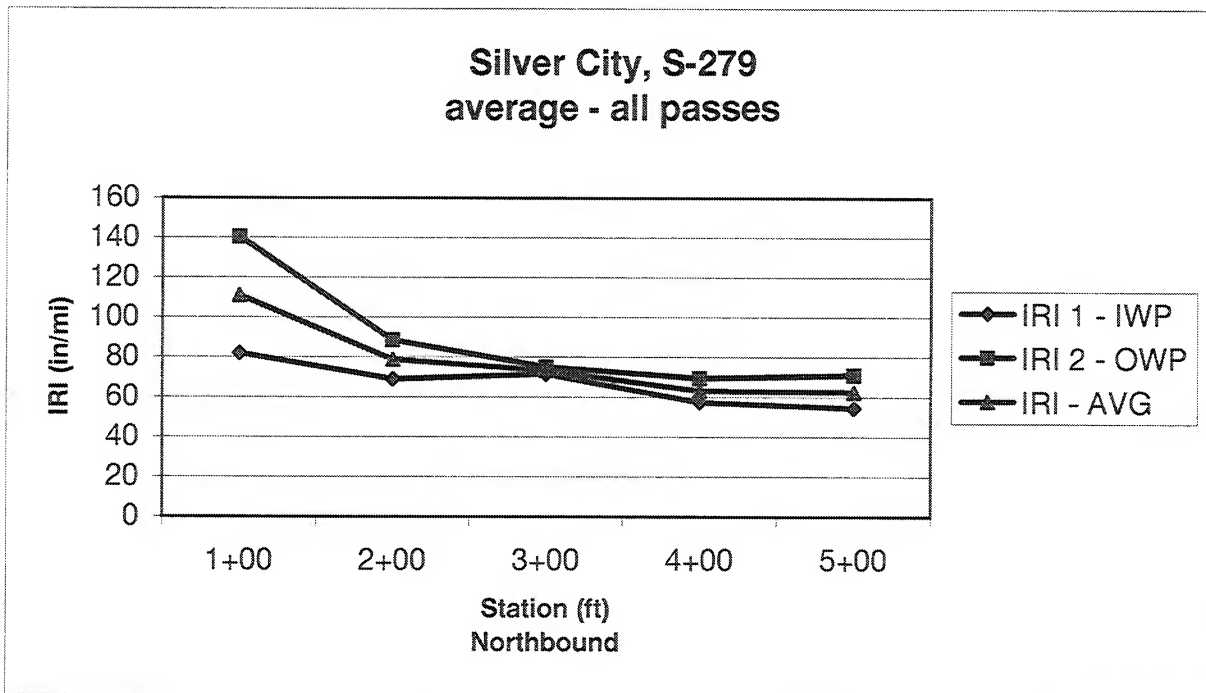
Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.16	0.034	58	136	97
2+00	100	200	100	0.15	0.034	65	82	74
3+00	200	300	100	0.16	0.030	70	77	74
4+00	300	400	100	0.15	0.033	68	71	70
5+00	400	500	100	0.16	0.035	56	70	63
AVG.				0.156	0.0332	63.4	87.2	75.3
STD.				0.005	0.002	6.148	27.707	12.868



Station	From	To	Length	Rut Depth	Rut Depth	IWP	OWP	AVG.
ft.	ft.	ft.	ft.	Average	Std.Dev.	IRI	IRI	IRI
				in.		in./mi.		
1+00	0	100	100	0.15	0.039	106	145	125
2+00	100	200	100	0.15	0.047	73	95	84
3+00	200	300	100	0.17	0.031	73	73	73
4+00	300	400	100	0.16	0.029	47	68	57
5+00	400	500	100	0.16	0.033	53	72	62
AVG.				0.158	0.036	70.4	90.6	80.2
STD.				0.008	0.007	23.082	32.192	27.124



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.16	0.037	82	140.5	111
2+00	100	200	100	0.15	0.041	69	88.5	78.75
3+00	200	300	100	0.17	0.031	71.5	75	73.25
4+00	300	400	100	0.16	0.031	57.5	69.5	63.25
5+00	400	500	100	0.16	0.034	54.5	71	62.5
AVG.				0.157	0.035	66.9	88.9	77.8
STD.				0.006	0.004	11.132	29.802	19.809



APPENDIX B
BECKHILL/DEERLODGE

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Beckhill / Deerlodge
 Longitude: 112°43' W
 Latitude: 46°28' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	3.9	4.7	4.3	Chip Seal
2	Pulverized	7.2	9.0	8.1	
3	Existing Base	31.7	34.5	33.1	Dark Brown Sandy Gravel
4	Subgrade	-	-	-	Brown-Gray Clayey Gravel

Materials Sampling

Date: 4/16/02

Material Type	Quantity	Comments
ACP	14 cores	2-10" & 12-6" cores
Base	4 bags	
Subgrade	7 bags	1 with 50 blows

SHRP REGION _____ STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING STATE CODE _____
 LTPP EXPERIMENT Beck Hill (W) ROUTE/HIGHWAY I-90 Lane Rt (outer) Direction East SHRP ASSIGNED ID _____
 SAMPLE/TEST: (a) Before Section √ #1 (b) After Section _____ FIELD SET NO. _____
 OPERATOR 4.3" Asphalt Dan M. LOG OF SHOULDER PROBE DCG SHEET: 08
 AUGERING DATE 4-16-02 EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 TOP OF ROCK BASED ON: _____ LOCATION STATION: PP181 (W. End) AUGER PROBE NUMBER 1
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR. OFFSET: _____ feet from °/s

Scale (feet)	Depth from ^{Base of PMS} Surface (Feet)	Material Description	Material Code
1	0.6	Recycled Asphalt	OLD RECYCLE @ PMS
2			
3	2.5 Below PMS Base	Dk brn sandy gravel Base Course	A-1 (Below PMS Base) 0.6 - 1.0 Sample 1.0 - 1.5 Sample
4	3.6		
5		Brn gravelly sand	2.5' Below Base 0.4 PMS - SPLIT
6	4.6	Subgrade	SPDN BLOW COUNT = 50 ~ 6.5" Total
7		grg brn clayey gravel (river pebbles & cobbles)	FROM SURFACE 4.0' Unsuccessful Shelby Tube
8			4.0 ~ 5.0 Sample
9	7.6		
10		dk grg sandy highly plast clay	5.0 - 6.0 Sample
11			
12			
13			
14	12.9		
15		grg-dk grg highly plast clay w/ some sand	
16	15.6		
17		gravel no sample at surface	
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ -19____
 Date

SHRP REGION _____

SHRP-LTPP

STATE CODE _____

STATE MT

FIELD MATERIAL SAMPLING
AND FIELD TESTING

SHRP ASSIGNED ID _____

LTPP EXPERIMENT Beck Hill CE ROUTE/HIGHWAY I-90

Lane Rt (outer) Direction E

SAMPLE/TEST: (a) Before Section _____ (b) After Section _____

FIELD SET NO. _____

LOG OF SHOULDER PROBE

DCG SHEET: 08

OPERATOR Don M.

EQUIPMENT USED _____

SHEET NUMBER / OF / _____

AUGERING DATE 4-16-02

LOCATION STATION: East End

AUGER PROBE NUMBER _____

TOP OF ROCK BASED ON: _____

OFFSET: _____

feet from °/s

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (feet)	Material Description	Material Code
1	5" PAS	Plant Mix Surfacing	
2	16" Pulverized		
3	35"	dk brn sandy gravel aggregate base	0-1' of Base
4	4.0'		1-1.5' of Base
5		Thin org sandy clay ~ 5.0'	35" split spoon sample
6	5.7'	brn - grey brn sandy clayey gravel	30 blowcount
7	Slow Drilling	Subgrade	3' to 4.5'
8		coarse gravel some clay	Sample - 0-9" Subgrade
9			Sample Subgrade
10		brn gravelly clay .5'	9" - 21"
11		dk grey sandy clay	
12		Highly plastic → Farris balls	
13	12.5'		
14		Lt grey wet Highly plastic clay w/some coarse sand	
15	15.0		
16	16.0	coarse gravel	
17	16.5	grs clay	
18		coarse gravels and interbedded plastic clays w/some sand	
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): N

DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED

VERIFIED AND APPROVED

MONTH-DAY-YEAR

G. Zeihen

_____-19

Crew Chief, Contractor

SHRP Representative

Date

Affiliation: MDT

Affiliation: _____

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Beckhill / Deerlodge

Longitude: 112°43' W

Latitude: 46°28' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR)

4/16/02

SURVEYOR 1: WT

SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3	EDGE CRACKING (METERS)	0.0	0.0	0.0
4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
5	REFLECTION CRACKING AT JOINTS	Not Recorded		
6	TRANSVERSE CRACKING			
	Number of Cracks	0	0	0
	Length (Meters)	0.0	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0
8	Potholes (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Beckhill / Deerlodge
 Longitude: 112°43' W
 Latitude: 46°28' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/16/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10 SHOving
 (Number)
 (Square Meters)

SURFACE DEFECTS

11 BLEEDING
 (Square Meters)

12 POLISHED AGGREGATE
 (Square Meters)

13 RAVELING
 (Square Meters)

MISCELLANEOUS DISTRESSES

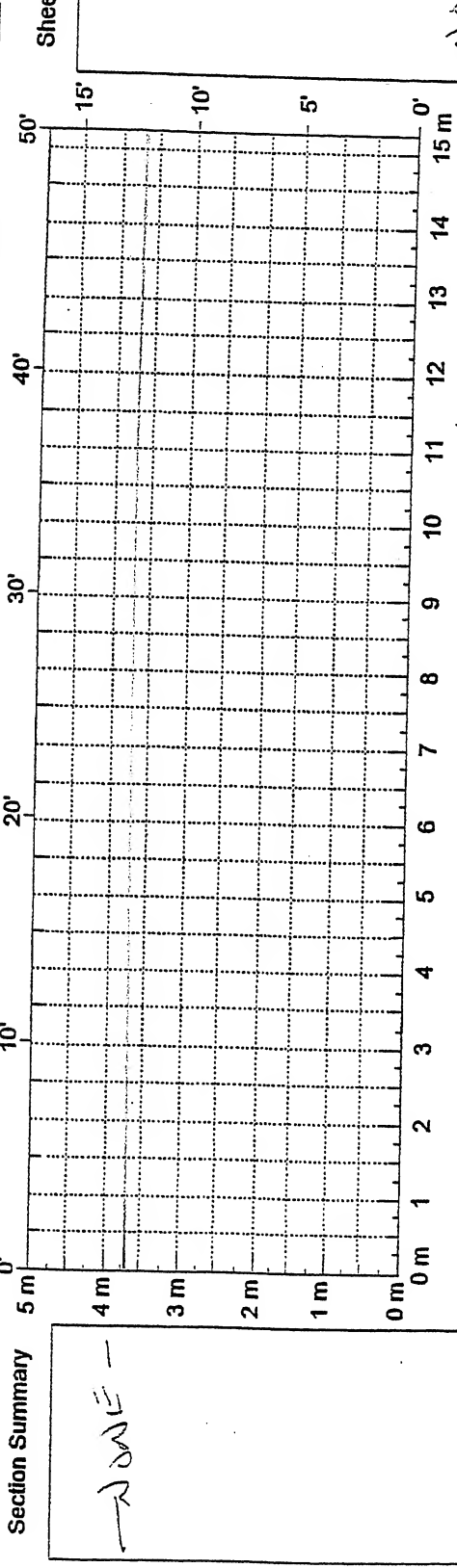
14 LANE-TO-SHOULDER DROPOFF - Not Recorded

15 WATER BLEEDING AND PUMPING
 (Number)
 Length of Affected Pavement
 (Meters)

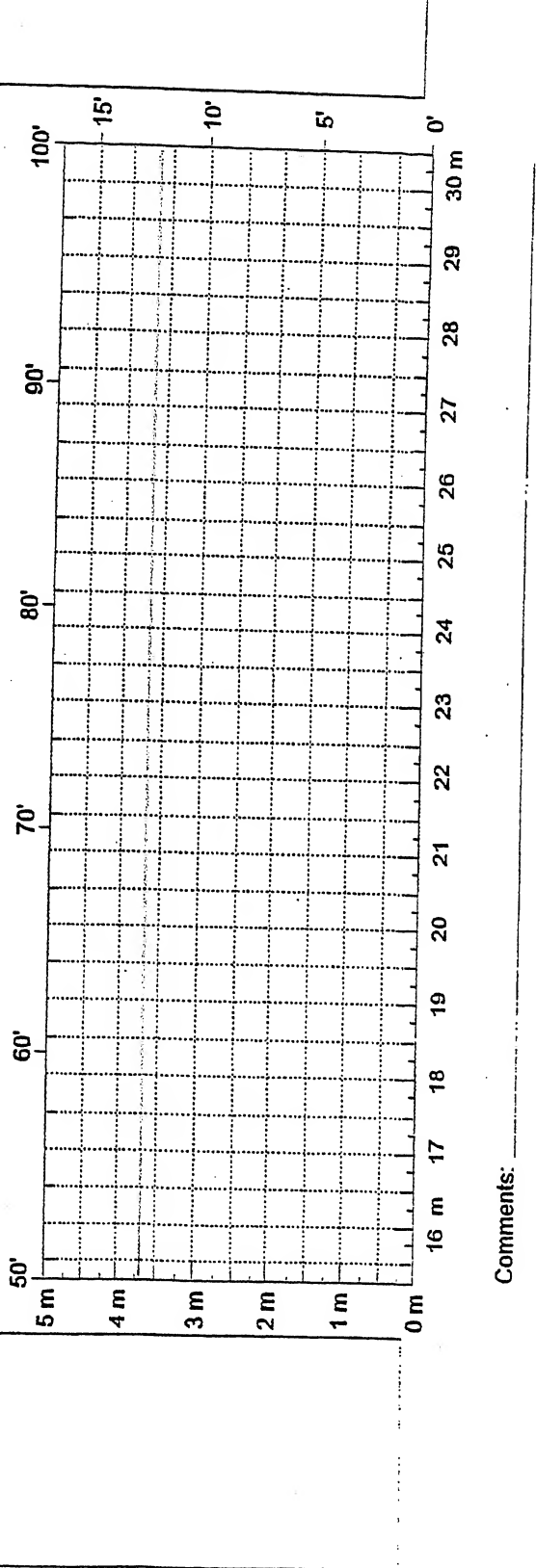
16 OTHER (Describe) Snow plough damage from 225 ft to 250 ft on outer
wheelpath

(Technology)

Reviewer: _____ State Assigned ID _____
 Surveyors: WT/BK Pavement Temp: _____
 Date: 4/15/02 Before _____ After _____
 State Code _____
 SHRP Section ID _____



Comments: _____



Comments: _____

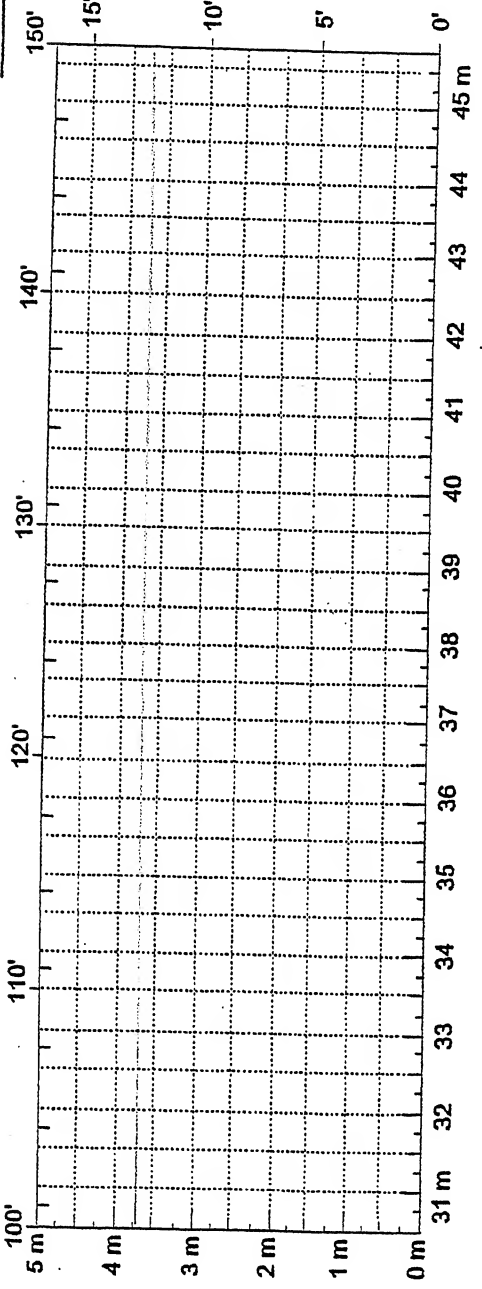
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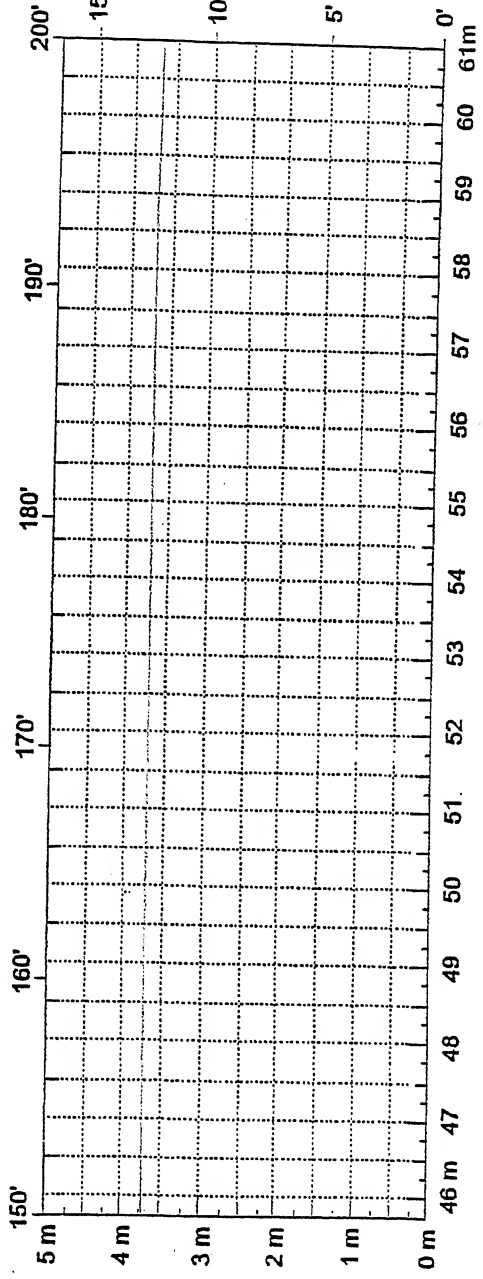
State Assigned ID _____
State Code _____
SHRP Section ID _____

Reviewer: _____
Date: _____

Surveyors: WT BK
Date: 4/16/02

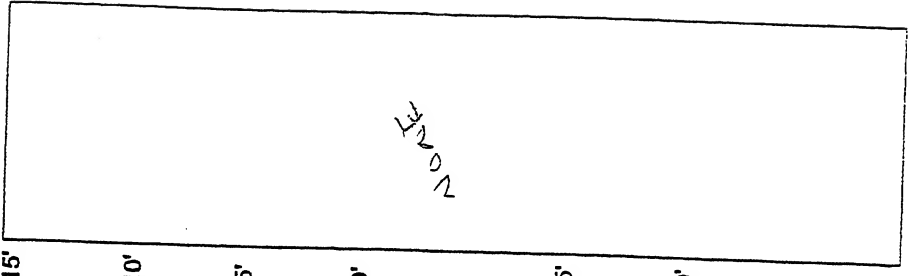


Comments: _____



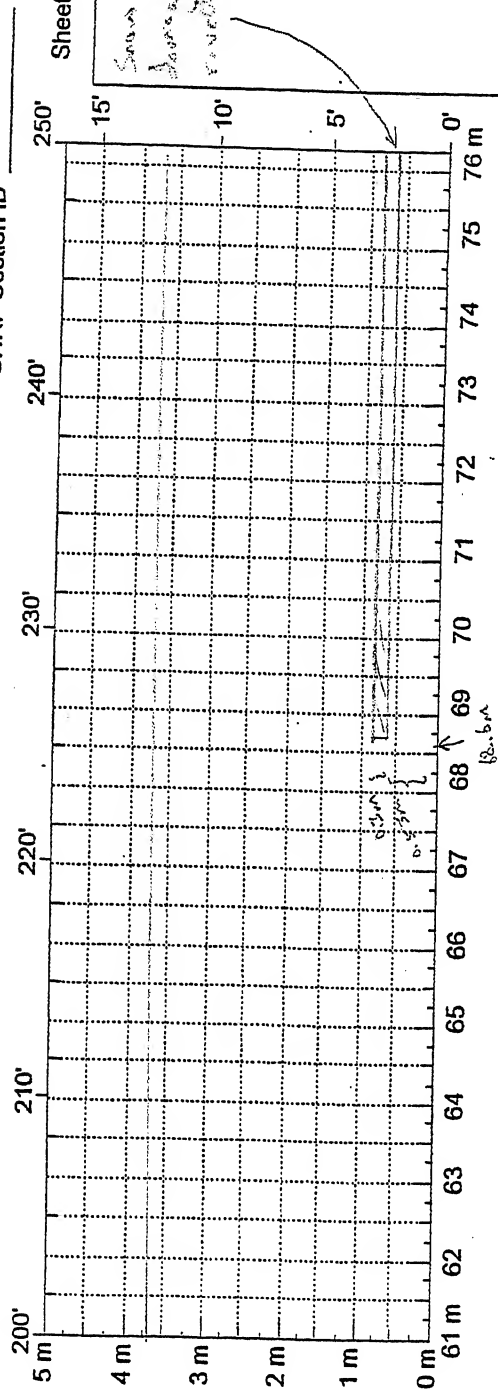
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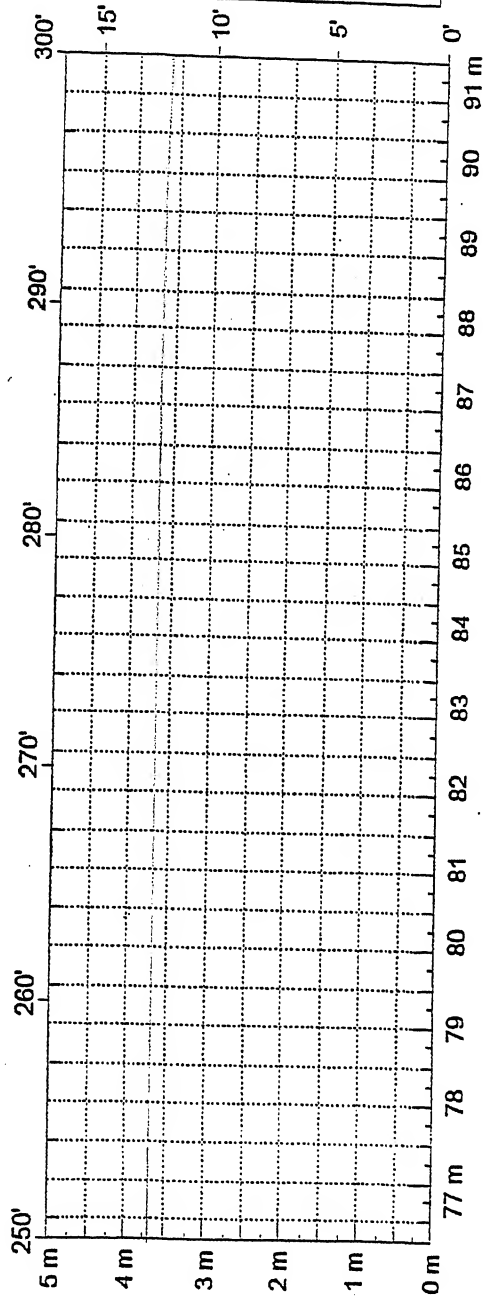


DATE

Reviewer: _____ State Assigned ID _____
 Surveyors: WJ (15K) State Code _____
 Date: 4/16/02 SHRP Section ID _____



Comments: _____



Comments: _____

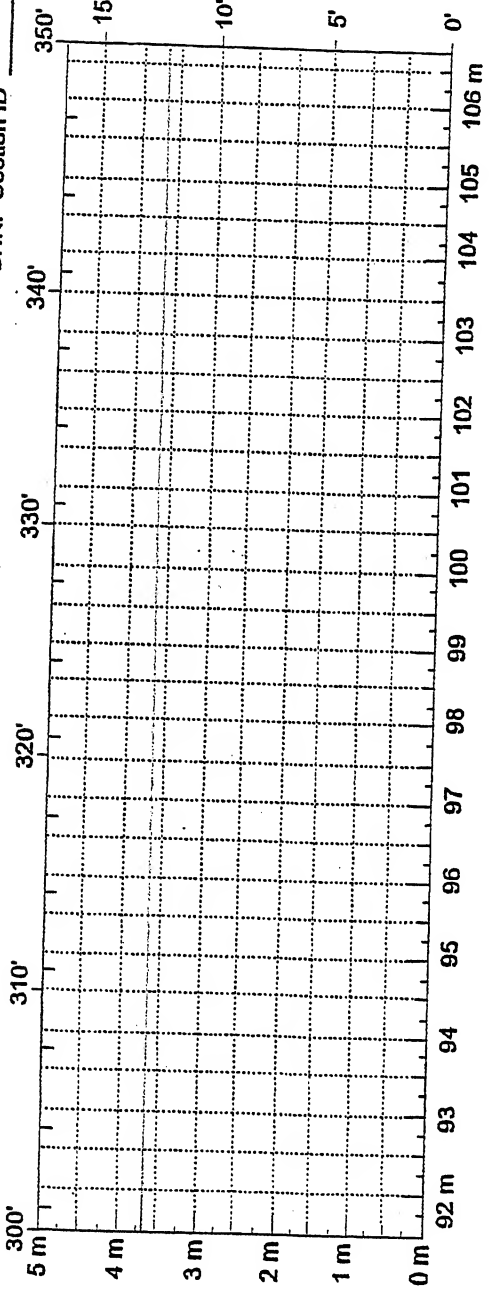
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 Survey Party
 Source: OTC
 Drawing:

Reviewer: _____
Date: _____

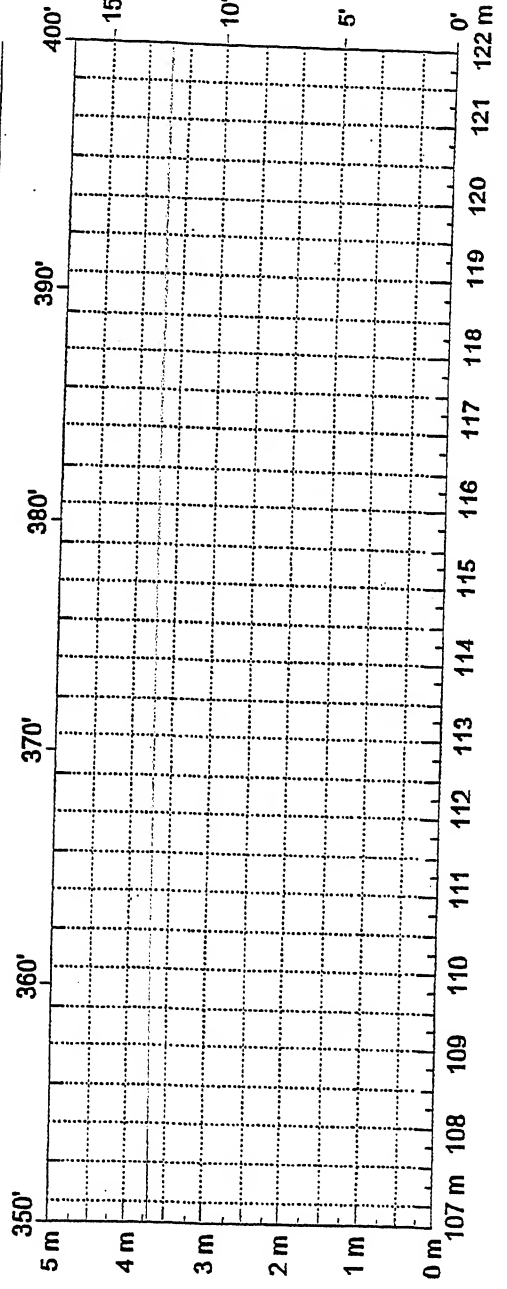
State Assigned ID _____
State Code _____

Surveyors: WJ/GK
Date: 4/13/02

SHRP Section ID _____



Comments: _____

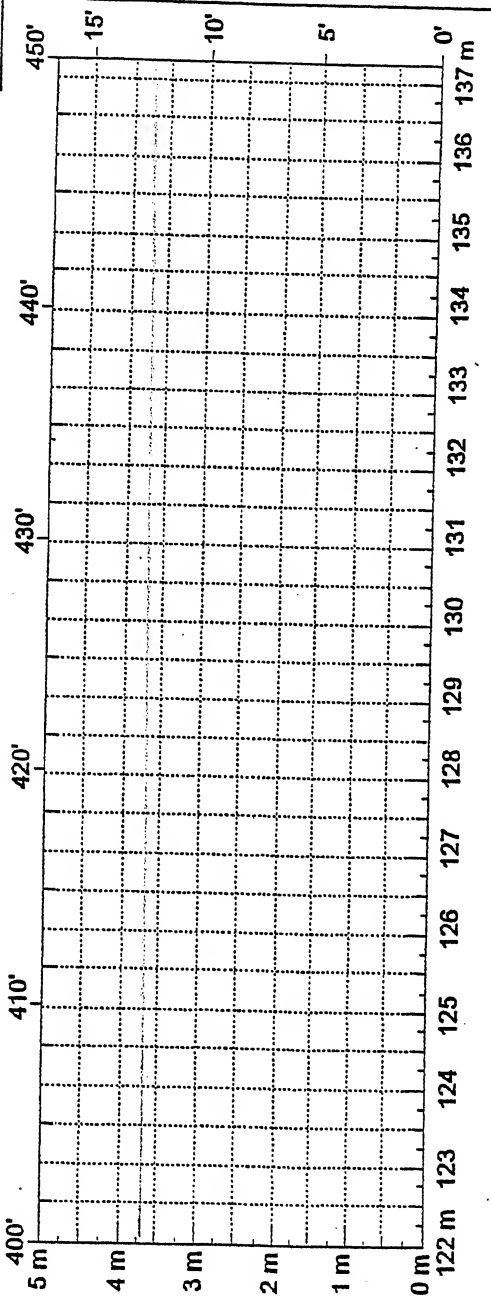


Comments: _____

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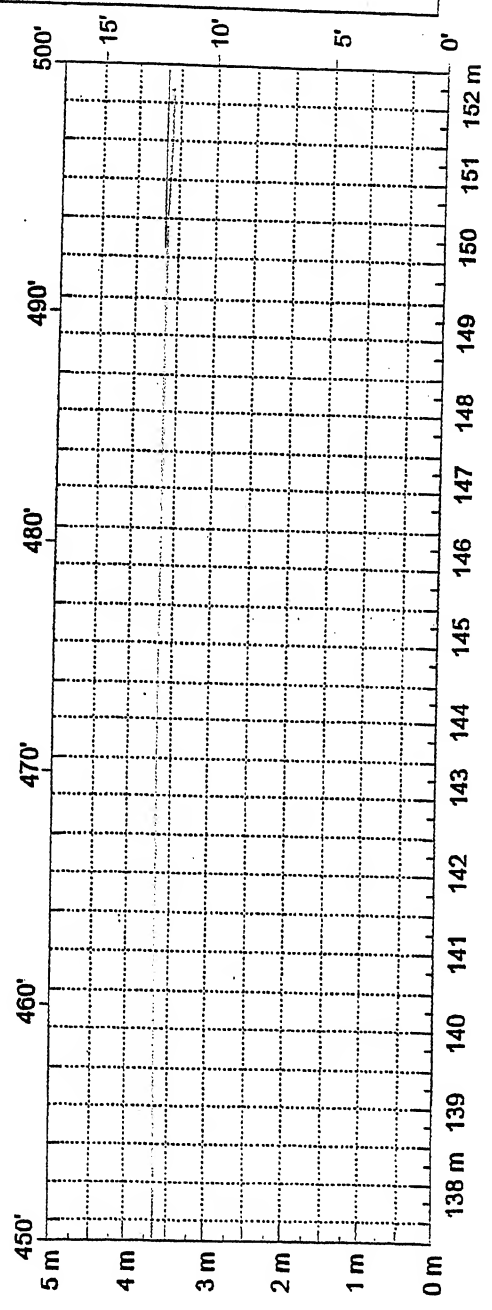
NONE

Reviewer: _____ State Assigned ID _____
 Date: _____ State Code _____
 Surveyors: UST / SK Pavement Temp: _____
 Date: 11/15/02 After _____
 SHRP Section ID _____



Comments: _____

Sheet Summary
 ASSUME



Comments: _____

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Beckhill / Deerlodge
 Longitude: 112°43' W
 Latitude: 46°28' N

FWD Data

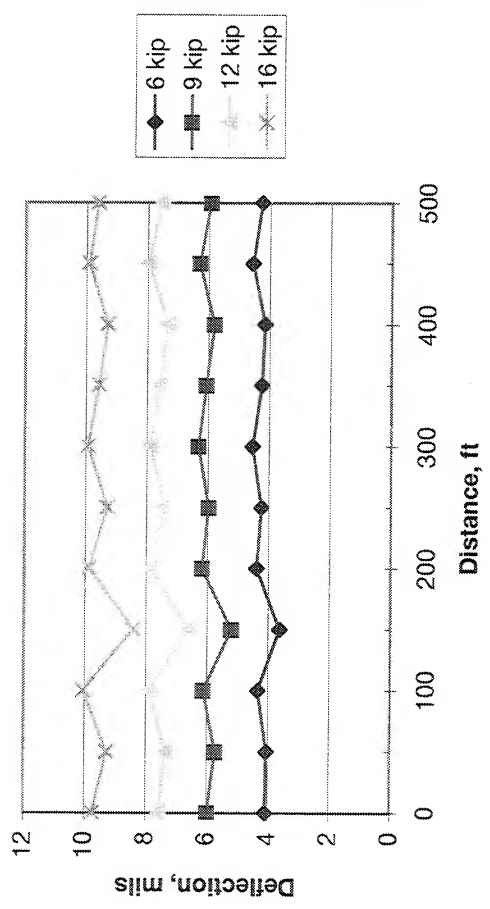
Test Date: 10/8/01

Layer	Material Type	Average Thickness in.
1	ACP	4.3
2	Pulverized	8.1
3	Existing Base	33.1
4	Subgrade	-

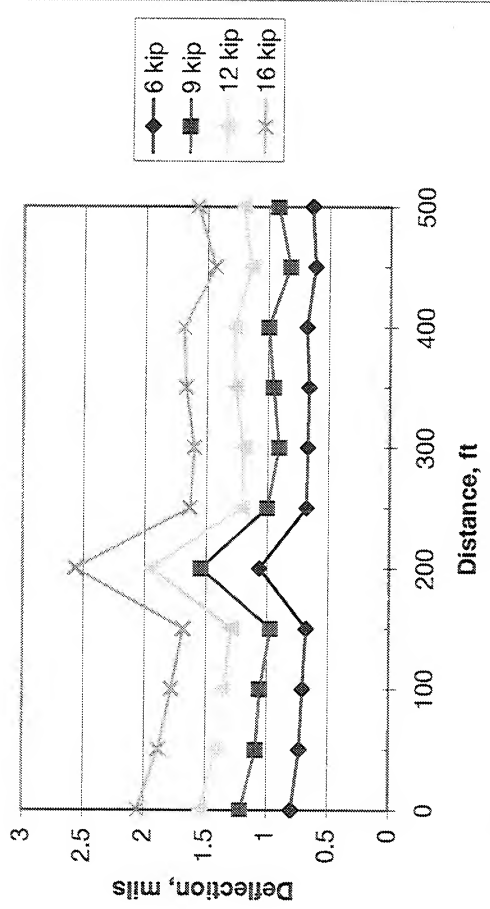
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	7.02	4.77	3.93	3.35	2.63	2.07	1.41	0.93
0+00	9.83	6.53	5.43	4.69	3.62	2.88	1.86	1.32
0+00	12.49	7.88	6.54	5.54	4.50	3.52	2.31	1.60
0+00	15.51	9.44	7.77	7.31	5.35	4.23	2.78	1.99
0+50	6.90	4.64	3.84	3.13	2.43	1.88	1.23	0.84
0+50	9.79	6.23	5.25	4.24	3.26	2.61	1.76	1.18
0+50	12.40	7.61	6.39	5.24	4.12	3.17	2.18	1.46
0+50	15.55	9.02	7.54	6.26	4.90	3.79	2.48	1.83
1+00	6.89	4.97	3.99	3.25	2.49	1.86	1.20	0.81
1+00	9.81	6.66	5.49	4.48	3.39	2.59	1.64	1.15
1+00	12.24	8.04	6.55	5.32	4.16	3.16	2.02	1.38
1+00	15.55	9.77	7.92	6.48	4.96	3.81	2.48	1.73
1+50	6.92	4.17	3.41	2.88	2.27	1.77	1.09	0.78
1+50	9.76	5.64	4.68	3.84	3.16	2.43	1.60	1.05
1+50	12.29	6.76	5.67	4.72	3.75	2.98	1.88	1.32
1+50	15.57	8.20	6.81	5.70	4.64	3.58	2.34	1.64
2+00	6.90	5.04	4.22	3.66	2.99	2.41	1.62	1.22
2+00	9.81	6.73	5.83	4.93	3.96	3.30	2.27	1.68
2+00	12.38	8.11	6.97	5.88	4.88	3.95	2.88	2.01
2+00	15.57	9.61	8.29	7.03	5.82	4.79	3.39	2.50
2+50	6.90	4.87	3.89	3.19	2.31	1.71	1.03	0.78
2+50	9.82	6.51	5.29	4.30	3.24	2.38	1.49	1.09
2+50	12.38	7.66	6.19	5.03	3.84	2.90	1.81	1.24
2+50	15.62	9.07	7.41	6.00	4.65	3.48	2.19	1.59

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	6.89	5.21	4.25	3.43	2.56	1.84	1.03	0.77
3+00	9.85	6.91	5.75	4.60	3.46	2.55	1.53	0.99
3+00	12.26	8.06	6.71	5.44	4.10	3.05	1.77	1.22
3+00	15.53	9.64	8.04	6.48	4.87	3.66	2.29	1.55
3+50	6.90	4.87	3.89	3.17	2.49	1.84	1.14	0.76
3+50	9.75	6.56	5.33	4.34	3.38	2.56	1.59	1.03
3+50	12.27	7.75	6.31	5.16	4.15	3.10	1.91	1.29
3+50	15.53	9.29	7.56	6.23	4.89	3.77	2.38	1.62
4+00	6.89	4.76	3.88	3.20	2.45	1.80	1.12	0.78
4+00	9.87	6.37	5.25	4.30	3.37	2.52	1.55	1.09
4+00	12.37	7.55	6.23	5.18	4.04	3.06	1.94	1.31
4+00	15.55	9.04	7.40	6.20	4.81	3.67	2.29	1.64
4+50	6.85	5.19	4.14	3.35	2.56	1.80	1.03	0.70
4+50	9.77	6.82	5.52	4.51	3.41	2.49	1.38	0.89
4+50	12.30	8.18	6.58	5.38	4.08	3.02	1.78	1.16
4+50	15.56	9.64	7.81	6.41	4.86	3.63	2.09	1.39
5+00	6.86	4.86	3.87	3.15	2.38	1.73	1.04	0.73
5+00	9.81	6.47	5.30	4.25	3.27	2.40	1.44	1.00
5+00	12.38	7.78	6.36	5.15	3.93	2.94	1.81	1.24
5+00	15.45	9.28	7.56	6.16	4.71	3.55	2.22	1.52

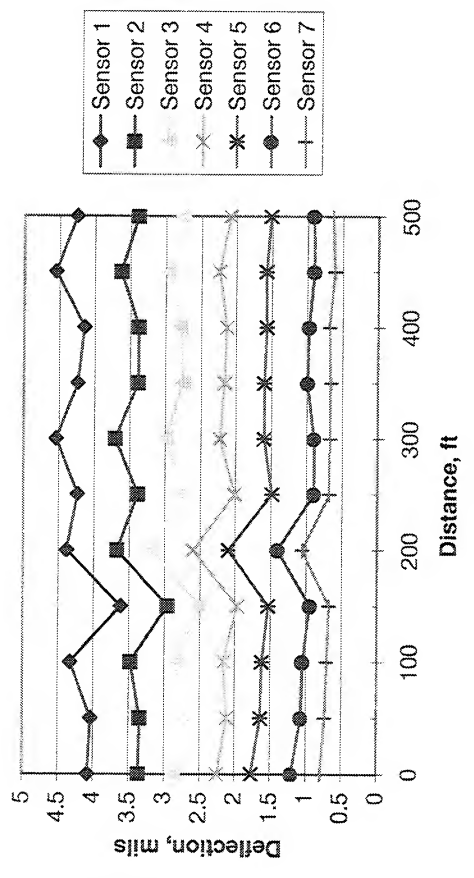
Beckhill, Sensor 1 Deflections



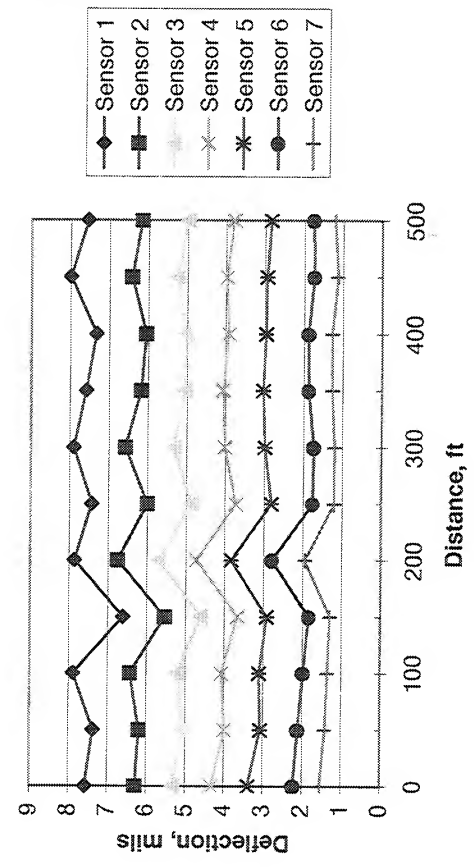
Beckhill, Sensor 7 Deflections



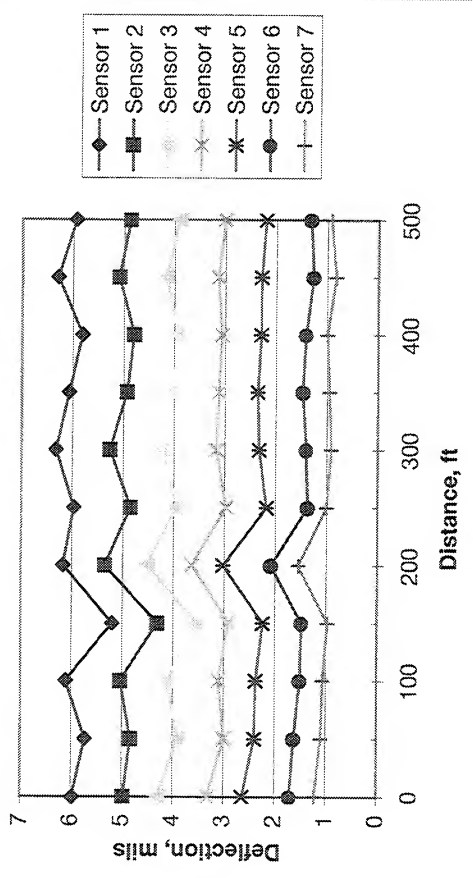
Beckhill, 6,000-lb Load



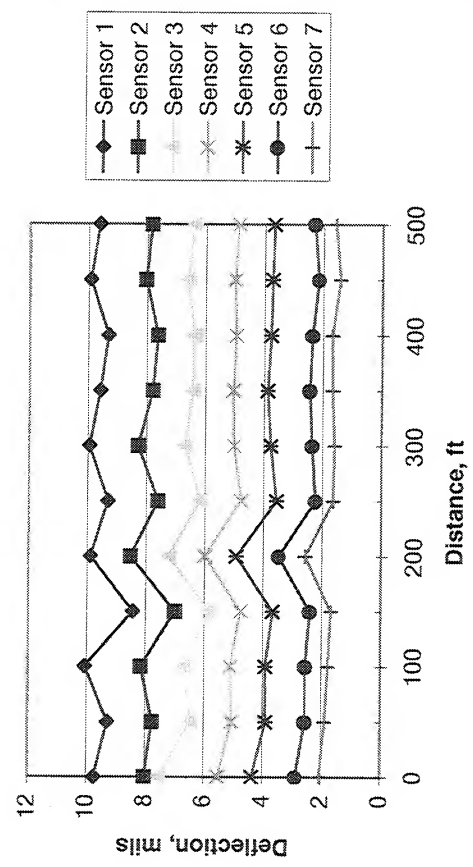
Beckhill, 12,000-lb Load



Beckhill, 9,000-lb Load



Beckhill, 16,000-lb Load



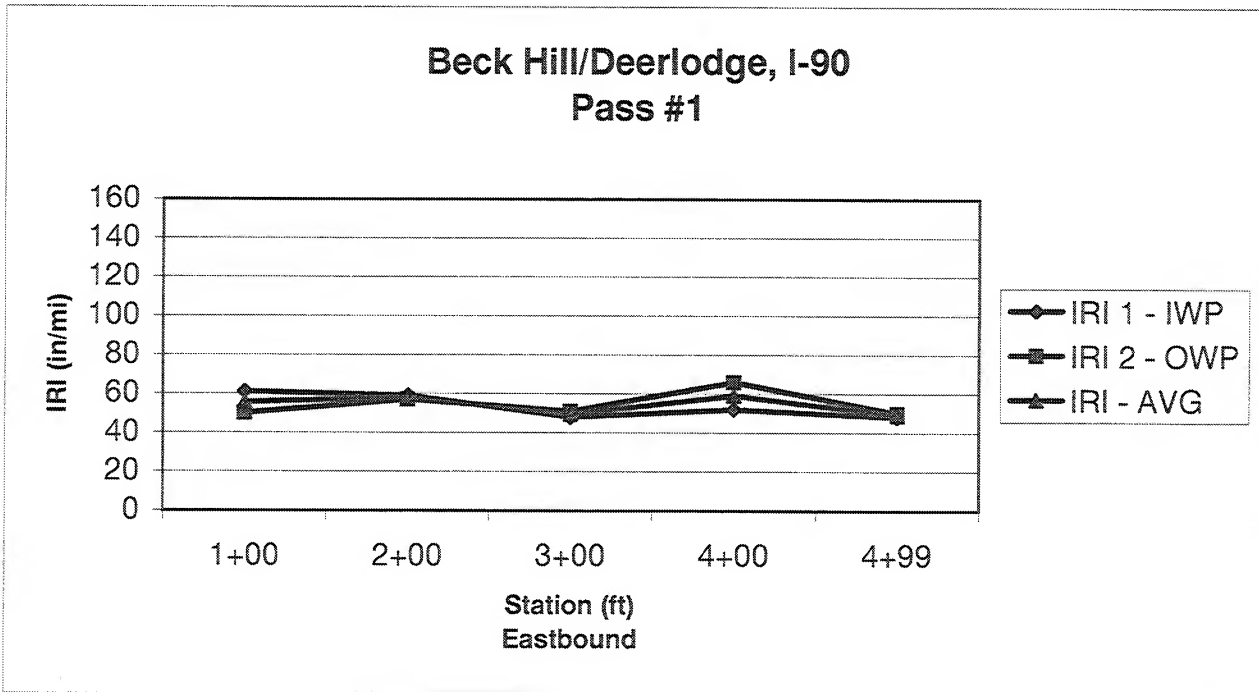
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Beckhill / Deerlodge
 Longitude: 112°43' W
 Latitude: 46°28' N

Profile Data

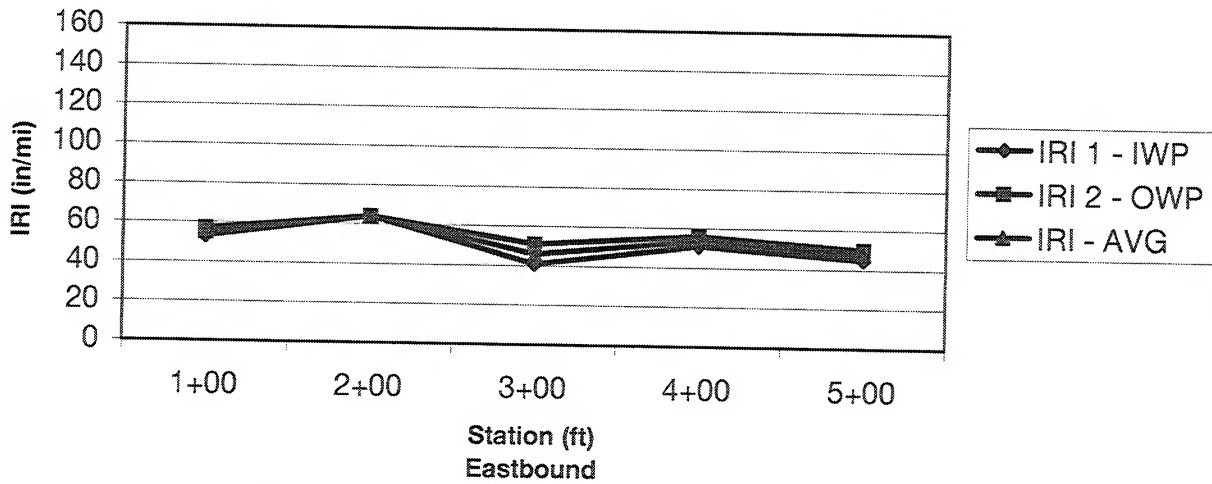
Test Date: 10/16/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.02	0.015	61	50	56
2+00	100	200	100	0.02	0.015	59	57	58
3+00	200	300	100	0.01	0.012	48	51	50
4+00	300	400	100	0.04	0.025	52	66	59
4+99	400	499	99	0.03	0.019	48	50	49
AVG.				0.024	0.017	53.6	54.8	54.2
STD.				0.011	0.005	6.107	6.907	4.698

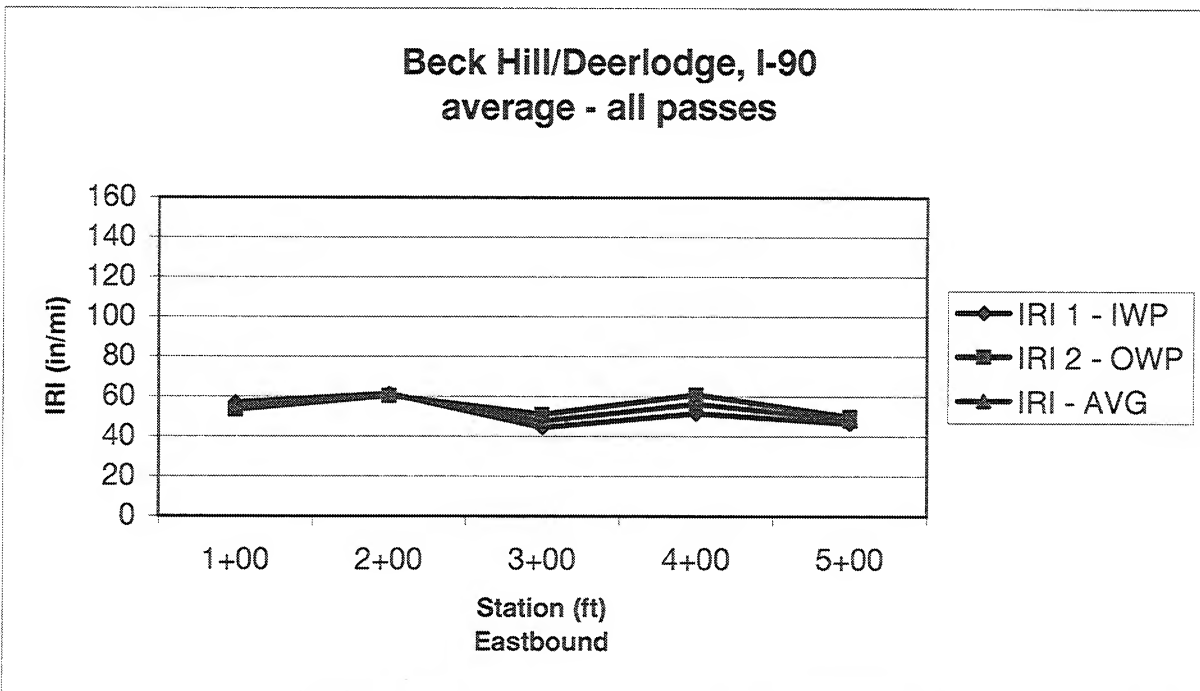


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.05	0.029	53	57	55
2+00	100	200	100	0.04	0.023	64	64	64
3+00	200	300	100	0.01	0.012	41	51	46
4+00	300	400	100	0.04	0.024	51	56	54
5+00	400	500	100	0.04	0.021	45	50	48
AVG.				0.036	0.022	50.8	55.6	53.2
STD.				0.015	0.006	8.786	5.595	7.147

**Beck Hill/Deerlodge, I-90
Pass #2**



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.04	0.022	57	53.5	55.25
2+00	100	200	100	0.03	0.019	61.5	60.5	61
3+00	200	300	100	0.01	0.012	44.5	51	47.75
4+00	300	400	100	0.04	0.025	51.5	61	56.25
5+00	400	500	100	0.04	0.020	46.5	50	48.25
AVG.				0.030	0.020	52.2	55.2	53.7
STD.				0.012	0.005	7.103	5.227	5.641



APPENDIX C

PERMA

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Perma
 Longitude: 114°36' W
 Latitude: 47°30' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	3.5	3.1	3.3	Chip Seal
2	CSB	3.8	4.5	4.1	
3	Base	6.0	6.0	6.0	No Information Recorded
4	Subgrade	-	-	-	Brown Sandy Clay with Fine Gravel

Materials Sampling

Date: 4/17/02

Material Type	Quantity	Comments
ACP / CSB	14 cores	2-10", 10-6", 2-4" cores
Base	2 bags	1 aggr.base & 1 CTB
Subgrade	8 bags	1 TBD

SHRP REGION _____
 STATE MT
 LTPP EXPERIMENT P-0-00
 SAMPLE/TEST: (a) Before Section V#1 (b) After Section _____

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____
 SHRP ASSIGNED ID _____
 Lane _____ Direction SB
 FIELD SET NO. _____

LOG OF SHOULDER PROBE

OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 AUGERING DATE 4-17-02 LOCATION STATION: RP 9.75 (N. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from °/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	3.5' PAS		
2	3 3/4" CTR 6" BC	Base Course	Split Spoon 326 blows
3		brn - org brn plastic clay w/ fine gravel	1st sample
4		Subgrade	Sample 2' - 3'
5			
6	6'		Sample 3' - 6' (X2)
7		Gry Clay	
8		Highly plastic	
9			
10		lt tan - pink clay	
11		Highly plastic	
12		very stiff	
13			
14			
15	14.5'		
16		gry shale gravel w/ tan clay	
17			
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ - 19____
 Date

SHRP REGION _____
 STATE MT

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____

LTPP EXPERIMENT Perma ROUTE/HIGHWAY S-382 Lane _____ Direction SB
 SAMPLE/TEST: (a) Before Section _____ (b) After Section V #2 FIELD SET NO. _____

LOG OF SHOULDER PROBE

OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 AUGERING DATE 4-17-02 LOCATION STATION: RP9.75 (S.E.N.) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from °/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	3.5" PMS		
2	4.5" CTR		
3	6" Base Course	Exist. Base Course	Split Spoon 23 blows
4		Subgrade	sample 10"-14"
5		brn sandy cly w/ some fine gravel	sample 14"-26"
6	5.5'		
7		L.T. pink-tan	sample 4'-6'
8		High plast. stiff clay	
9			
10	10'		
11		gry shale; sat. gravel w/ brn cly	
12			
13			
14	13.5'		
15		brn plast. cly w/ gravel (wet)	
16			
17			
18	18.0'		
19		brn sandy cly - sat/very wet	
20			

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ -19____
 Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Perma
 Longitude: 114°36' W
 Latitude: 47°30' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/17/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3	EDGE CRACKING (METERS)	0.0	0.0	0.0
4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
5	REFLECTION CRACKING AT JOINTS	Not Recorded		
6	TRANSVERSE CRACKING			
	Number of Cracks	0	0	0
	Length (Meters)	0.0	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0
8	Potholes (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Perma
 Longitude: 114°36' W
 Latitude: 47°30' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/17/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10 SHOoving
 (Number)
 (Square Meters)

SURFACE DEFECTS

11 BLEEDING
 (Square Meters)

12 POLISHED AGGREGATE
 (Square Meters)

13 RAVELING
 (Square Meters)

MISCELLANEOUS DISTRESSES

14 LANE-TO-SHOULDER DROPOFF - Not Recorded

15 WATER BLEEDING AND PUMPING
 (Number)
 Length of Affected Pavement
 (Meters)

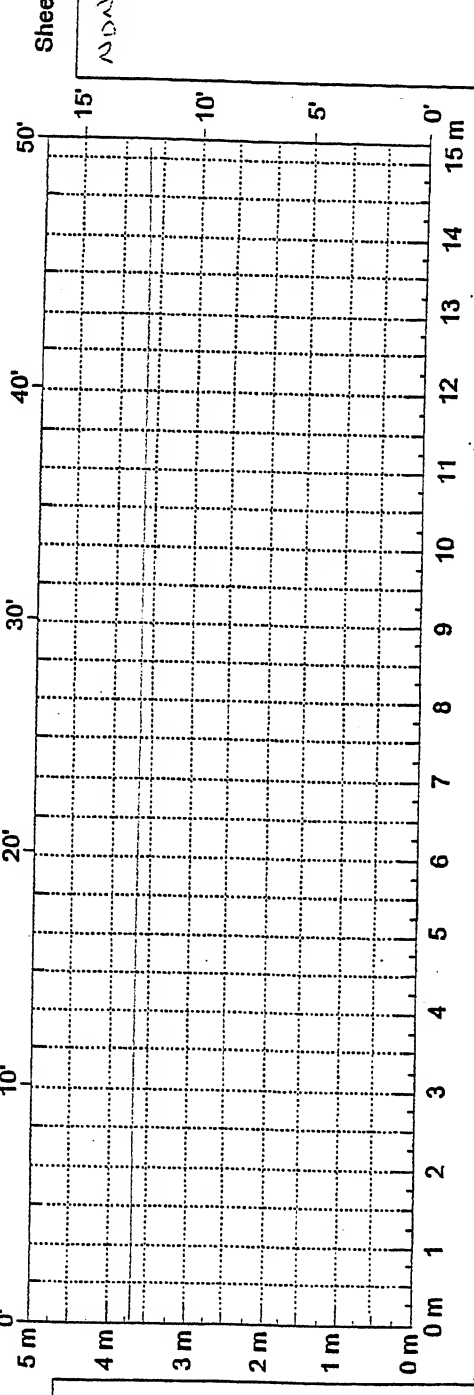
16 OTHER (Describe) no distress observed

State Assigned ID _____
State Code _____
SHRP Section ID _____

Pavement Temp: _____
Before _____ After _____

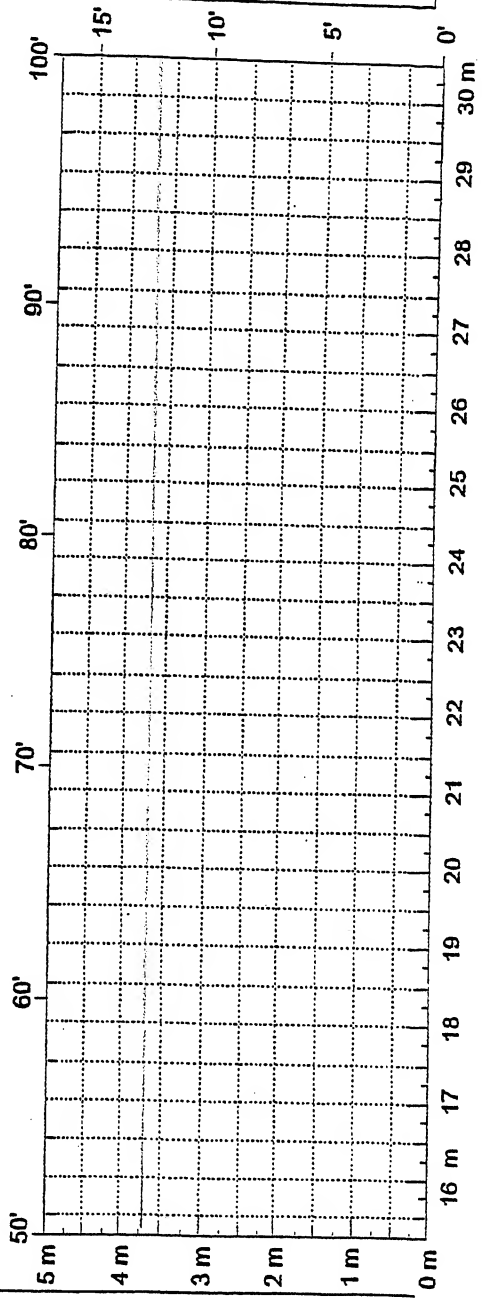
Surveyors: WT/DS
Date: 4/17/02

Reviewer: _____
Date: _____



Section Summary
No distinctive
observations

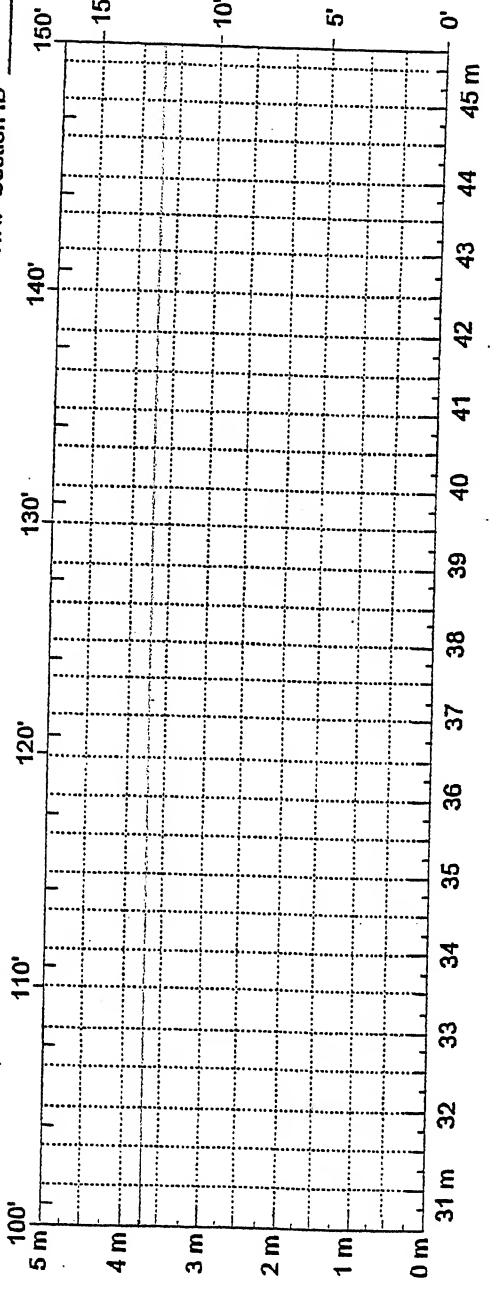
Comments: _____



Comments: _____

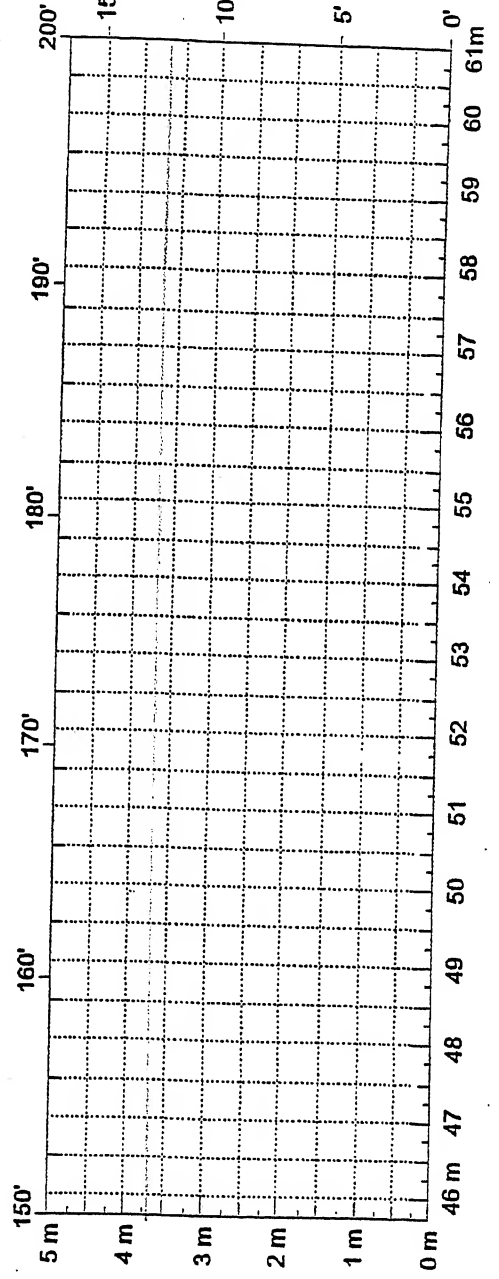
Sheet Summary
NONE

Reviewer: _____ State Assigned ID _____
 Surveyors: WT/BS State Code _____
 Date: 4/17/02 SHRP Section ID _____



Comments: _____

Sheet Summary
NONE

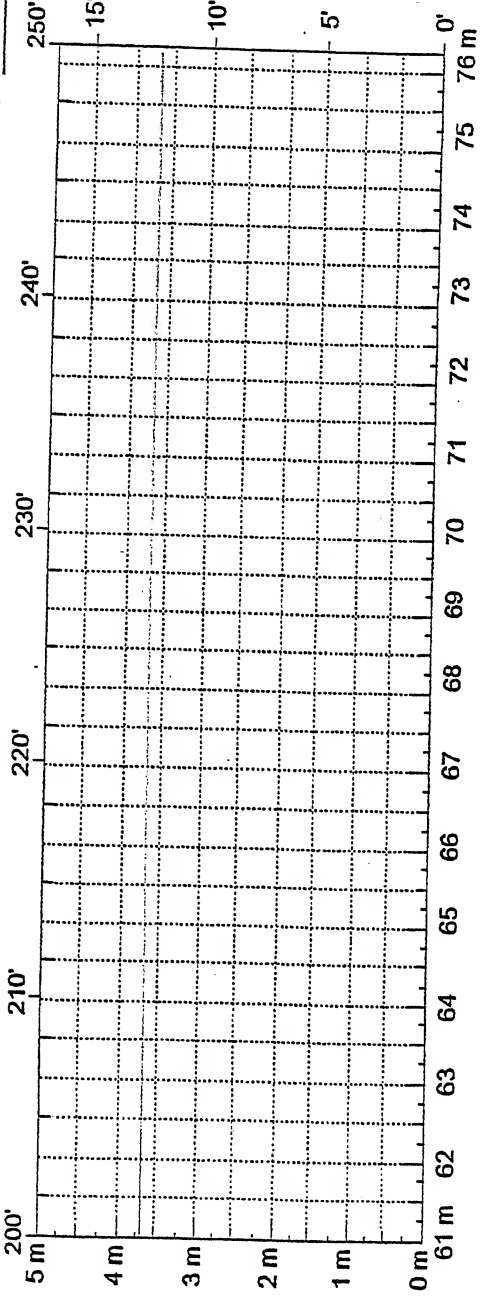


Comments: _____

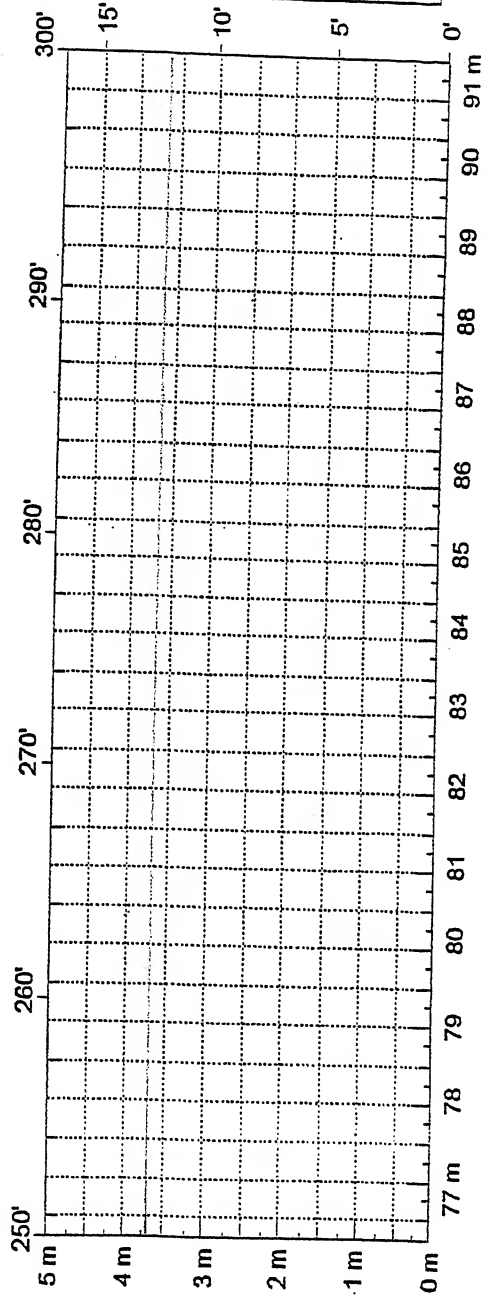
State Assigned ID _____
State Code _____
SHRP Section ID _____

Reviewer: _____
Date: _____

Surveyors: ST (55)
Date: 4/17/02



Comments: _____

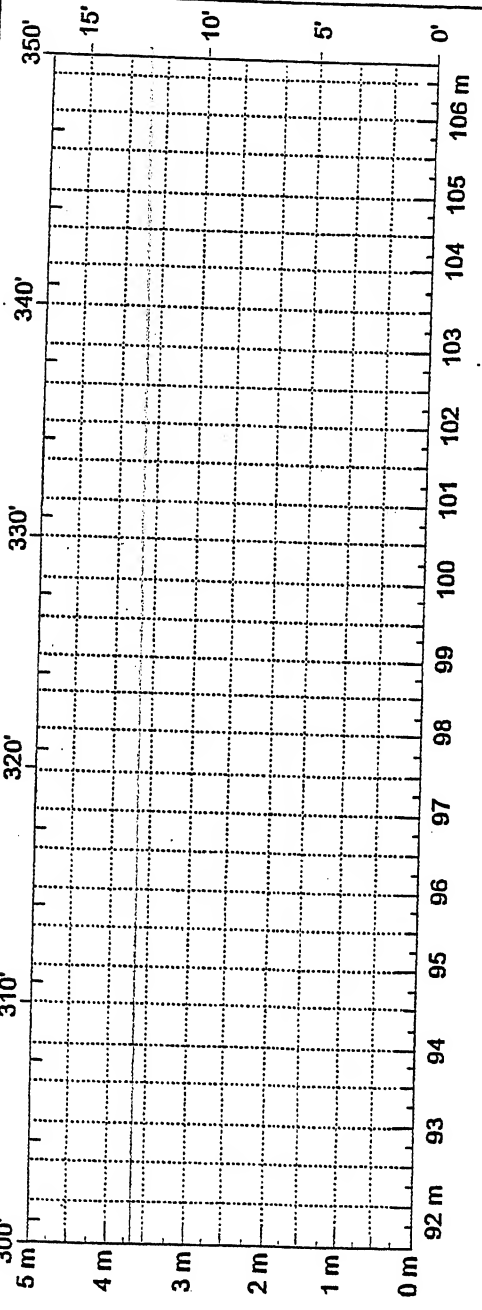


Comments: _____

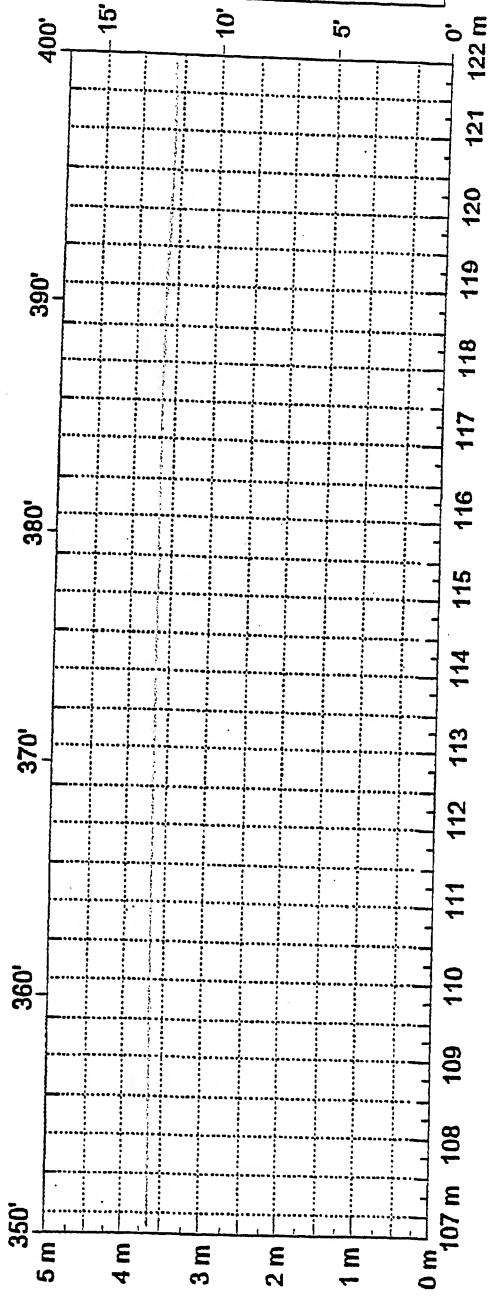
Sheet Summary
NONE

State Assigned ID _____
State Code _____
SHRP Section ID _____

Reviewer: _____
Date: _____
Surveyors: WT/LS
Date: 4/17/02



Comments: _____

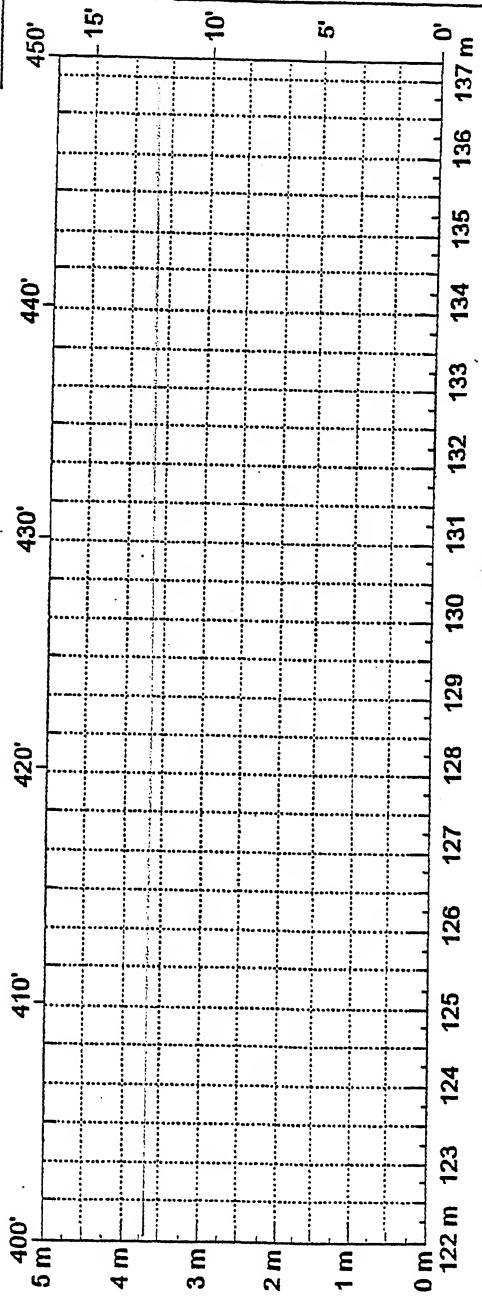


Comments: _____

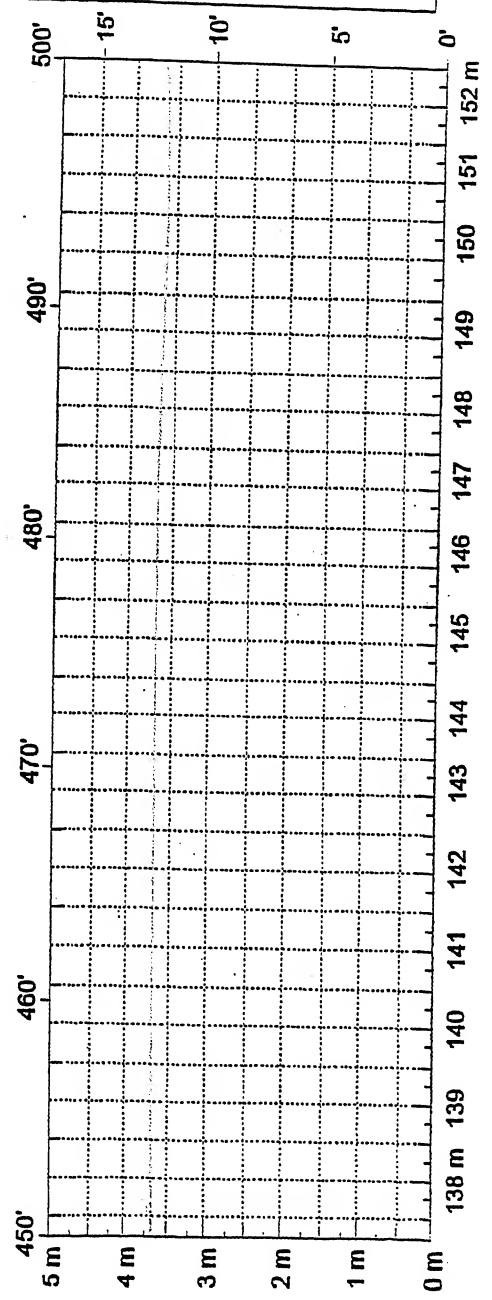
Sheet Summary

None

Reviewer: _____ State Assigned ID _____
 Date: _____ Surveyors: WKS / BS State Code _____
 Pavement Temp: _____
 After _____ SHRP Section ID _____



Comments: _____



Comments: _____

Sheet Summary
 NONE

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Perma
 Longitude: 114°36' W
 Latitude: 47°30' N

FWD Data

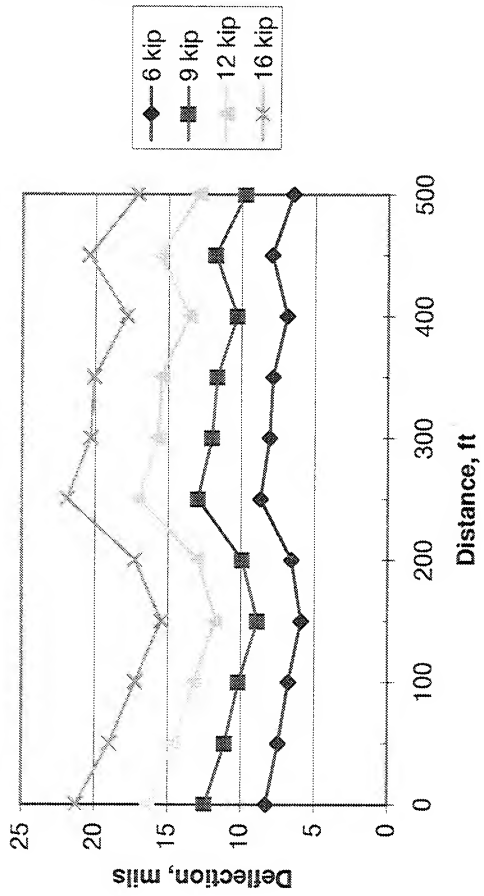
Test Date: 10/8/01

Layer	Material Type	Average Thickness in.
1	ACP	3.3
2	CSB	4.1
3	Base	6.0
4	Subgrade	-

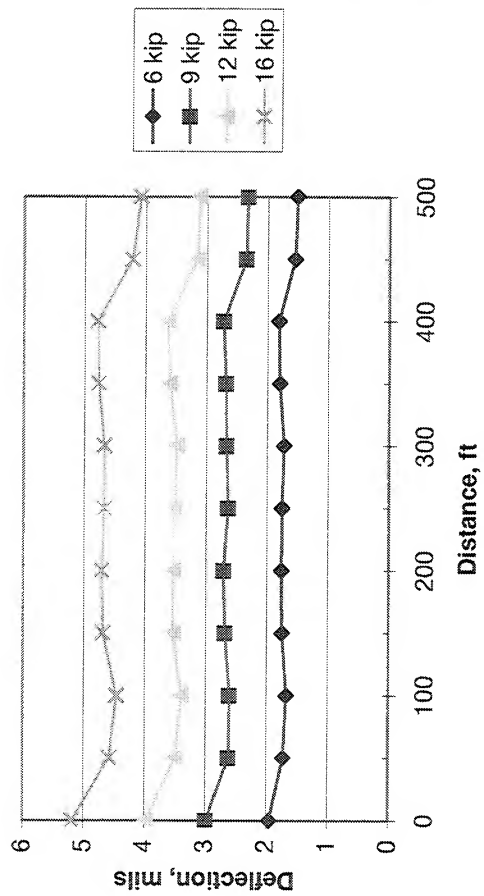
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	7.20	9.95	8.59	7.60	6.40	5.29	3.45	2.34
0+00	9.71	13.45	11.66	10.35	8.69	7.24	4.77	3.22
0+00	11.90	16.22	14.11	12.58	10.57	8.81	5.81	3.95
0+00	15.02	19.97	17.23	15.40	12.92	10.83	7.20	4.87
0+50	7.19	8.93	7.76	6.81	5.67	4.62	3.03	2.07
0+50	9.76	12.03	10.52	9.25	7.70	6.32	4.25	2.84
0+50	11.96	14.58	12.74	11.27	9.39	7.71	5.16	3.49
0+50	15.19	18.05	15.75	13.98	11.58	9.51	6.40	4.35
1+00	7.16	8.07	6.95	6.13	5.16	4.24	2.92	2.00
1+00	9.70	10.95	9.56	8.47	7.10	5.89	4.03	2.81
1+00	12.00	13.25	11.58	10.28	8.58	7.15	4.89	3.40
1+00	15.28	16.47	14.41	12.82	10.71	8.96	6.11	4.26
1+50	7.14	7.03	6.25	5.66	4.91	4.14	2.96	2.08
1+50	9.79	9.66	8.64	7.81	6.79	5.78	4.14	2.92
1+50	12.07	11.81	10.53	9.53	8.26	7.03	5.02	3.56
1+50	15.22	14.70	13.14	11.93	10.32	8.72	6.27	4.46
2+00	7.14	7.80	6.95	6.19	5.27	4.31	3.03	2.09
2+00	9.69	10.67	9.56	8.54	7.29	5.96	4.17	2.92
2+00	12.07	13.06	11.75	10.47	8.92	7.32	5.08	3.55
2+00	15.39	16.60	14.85	13.35	11.36	9.26	6.44	4.53
2+50	7.08	10.24	8.51	7.24	5.78	4.58	3.08	2.07
2+50	9.59	13.82	11.57	9.85	7.89	6.33	4.19	2.81
2+50	11.82	16.76	13.99	11.98	9.67	7.73	5.17	3.47
2+50	14.96	20.48	17.17	14.88	12.00	9.65	6.46	4.37

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	7.11	9.56	8.11	7.03	5.77	4.65	3.06	2.04
3+00	9.68	12.91	11.07	9.64	7.92	6.41	4.31	2.87
3+00	11.89	15.56	13.27	11.66	9.58	7.79	5.18	3.45
3+00	15.04	19.10	16.49	14.54	11.95	9.72	6.44	4.39
3+50	7.06	9.23	8.08	7.08	5.90	4.77	3.17	2.11
3+50	9.61	12.45	10.93	9.62	7.98	6.49	4.34	2.86
3+50	11.95	15.41	13.49	11.93	9.85	8.05	5.34	3.58
3+50	15.15	18.98	16.77	14.78	12.23	9.99	6.68	4.51
4+00	7.07	8.11	7.03	6.28	5.37	4.45	3.08	2.13
4+00	9.65	11.04	9.61	8.62	7.36	6.13	4.20	2.91
4+00	12.01	13.54	11.83	10.64	9.06	7.55	5.21	3.64
4+00	14.98	16.70	14.59	13.07	11.15	9.32	6.43	4.48
4+50	7.18	9.47	8.06	6.95	5.54	4.38	2.83	1.85
4+50	9.69	12.69	10.91	9.42	7.59	5.97	3.88	2.53
4+50	11.86	15.38	13.24	11.45	9.31	7.29	4.75	3.12
4+50	15.02	19.16	16.47	14.28	11.55	9.15	5.95	3.96
5+00	7.11	7.69	6.61	5.87	4.86	3.93	2.64	1.79
5+00	9.70	10.53	9.14	8.12	6.72	5.47	3.62	2.51
5+00	11.95	12.90	11.23	9.96	8.30	6.71	4.47	3.10
5+00	15.07	16.12	13.98	12.44	10.28	8.33	5.58	3.85

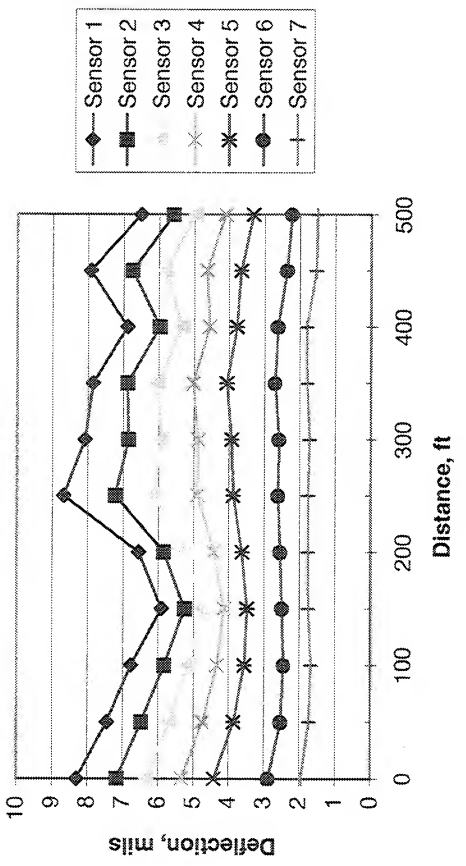
Perma, Sensor 1 Deflections



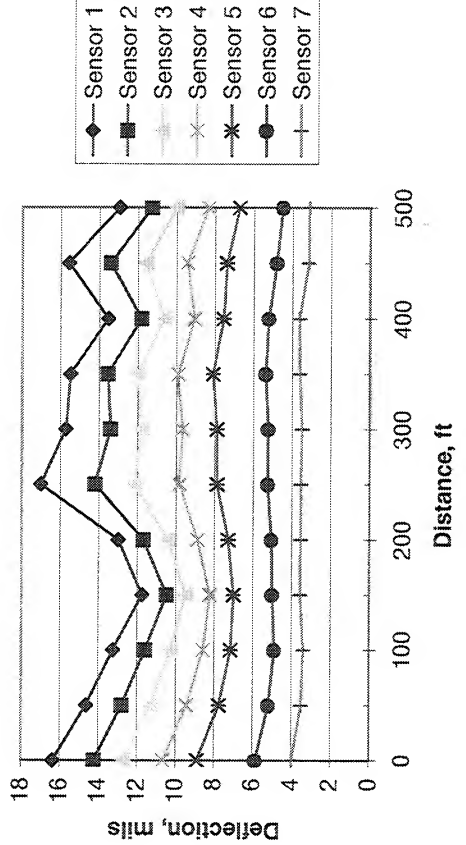
Perma, Sensor 7 Deflections



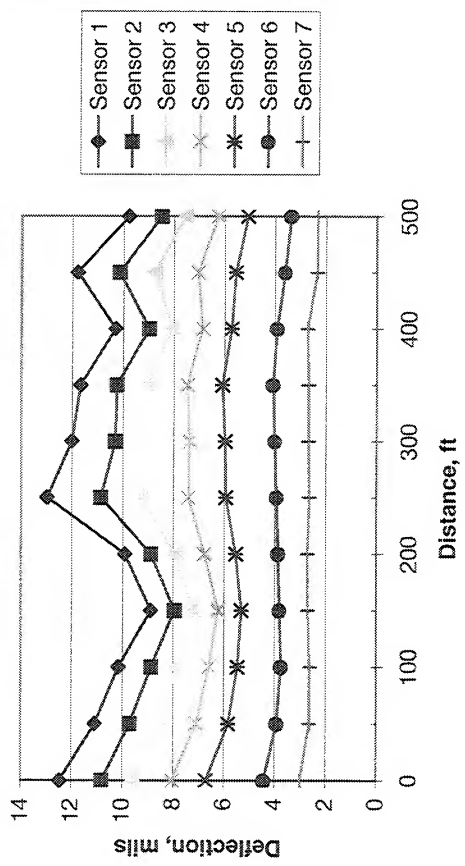
Perma, 6,000-lb Load



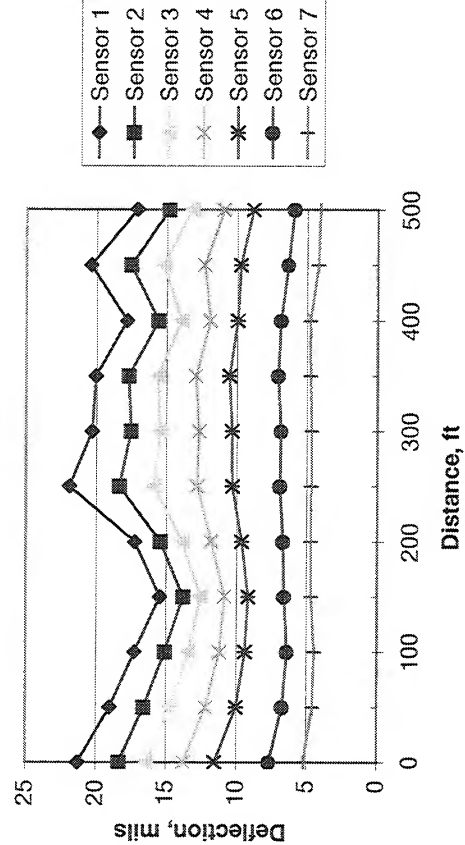
Perma, 12,000-lb Load



Perma, 9,000-lb Load



Perma, 16,000-lb Load



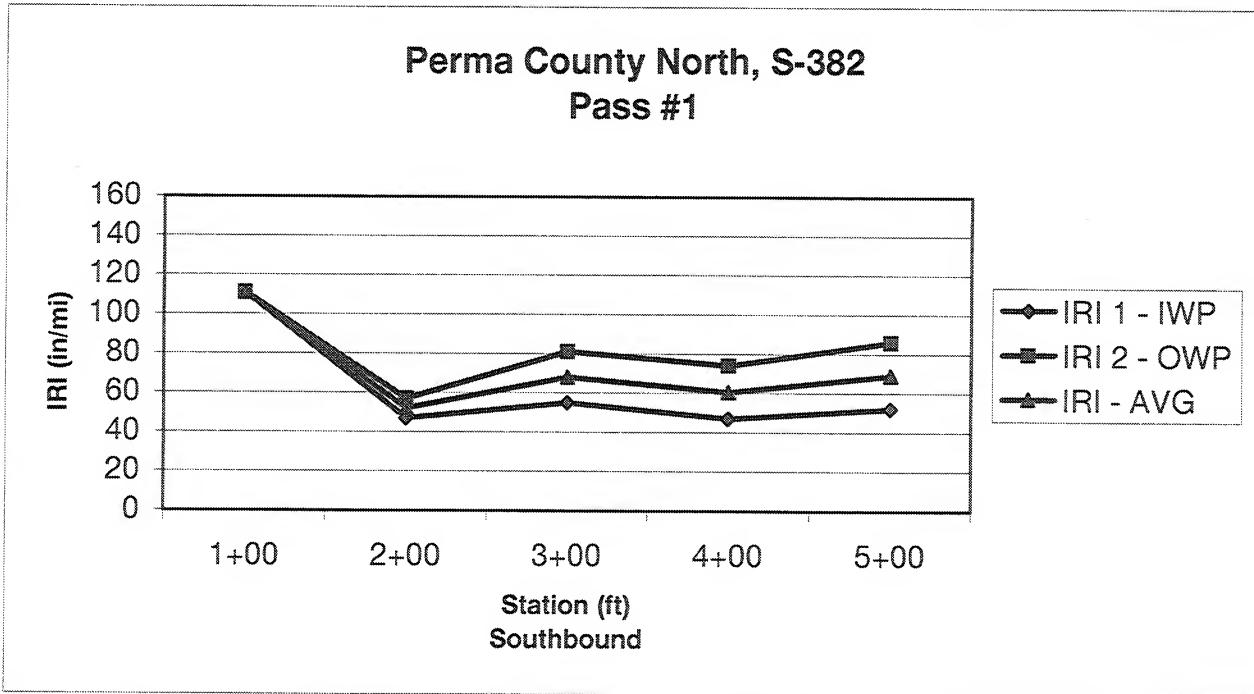
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Perma
 Longitude: 114°36' W
 Latitude: 47°30' N

Profile Data

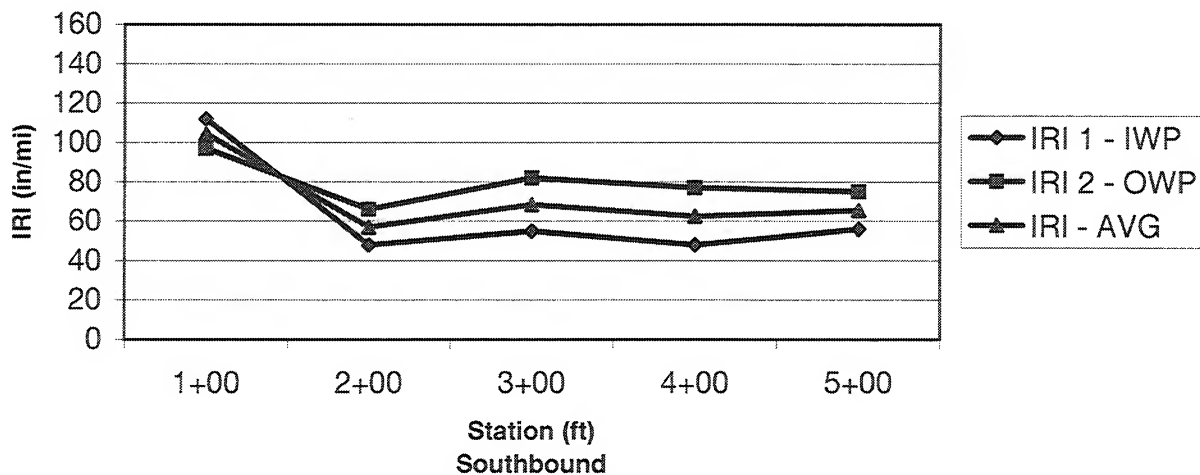
Test Date: 10/15/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.05	0.025	111	111	111
2+00	100	200	100	0.04	0.02	47	57	52
3+00	200	300	100	0.06	0.023	55	81	68
4+00	300	400	100	0.07	0.022	47	74	61
5+00	400	500	100	0.08	0.023	52	86	69
AVG.				0.06	0.023	62.4	81.8	72.1
STD.				0.016	0.002	27.382	19.665	22.794

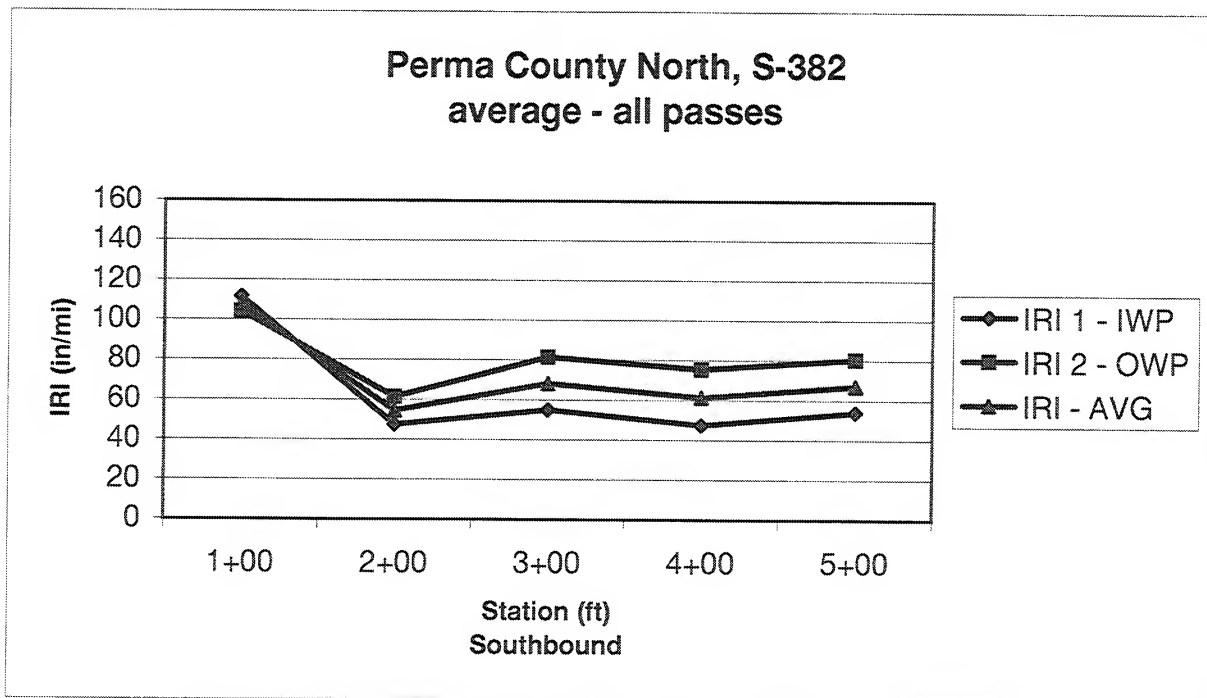


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.04	0.022	112	97	105
2+00	100	200	100	0.04	0.019	48	66	57
3+00	200	300	100	0.06	0.022	55	82	69
4+00	300	400	100	0.07	0.021	48	77	63
5+00	400	500	100	0.09	0.023	56	75	66
AVG.				0.06	0.021	63.8	79.4	71.6
STD.				0.021	0.002	27.207	11.415	18.876

**Perma County North, S-382
Pass #2**



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.05	0.024	111.5	104	107.75
2+00	100	200	100	0.04	0.020	47.5	61.5	54.5
3+00	200	300	100	0.06	0.023	55	81.5	68.25
4+00	300	400	100	0.07	0.022	47.5	75.5	61.5
5+00	400	500	100	0.09	0.023	54	80.5	67.25
AVG.				0.060	0.022	63.1	80.6	71.9
STD.				0.018	0.002	27.284	15.323	20.803



APPENDIX D

CONDON

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Condon
 Longitude: 113°44' W
 Latitude: 47°33' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	5.5	5.3	5.4	Chip Seal
2	Pulverized	8.8	9.2	9.0	
3	Base	26.8	21.5	24.1	Dark Brwn Clayey Grvl(some Wooden Frag.)
4	Subgrade	-	-	-	Brwn-Red Sandy Clay w/ Coarse & Fine Grvl

Materials Sampling

Date: 4/18/02

Material Type	Quantity	Comments
ACP	14 cores	2-10" & 12-6" cores
Pulverized	3 bags	1 split spoon
Base	7 bags	3 split spoon, 1 TBD
Subgrade	6 bags	1 split spoon

SHRP REGION _____
 STATE MT

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____

LTPP EXPERIMENT Condon N ROUTE/HIGHWAY P-83 Lane _____ Direction NB
 SAMPLE/TEST: (a) Before Section V#1 (b) After Section _____ FIELD SET NO. _____

OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 AUGERING DATE 4-18-02 LOCATION STATION: RP+3.45 (N. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from o/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (Feet)	Depth from Surface (Feet)	Material Description	Material Code
1	6.25" PMS	PMS	
2	8"	Pulver BC	Split spoon 45 blows 2.1' From surface
3		dk brn clayey gravel & 10% wood frags	6.25" - 14.25" sample
4		existing BC	
5		Hit rock @ ~ 24"	19" - 24" sample exist
6	41"		Base Course
7		Split Spoon brn - red brn sandy cly w/ fine gravel	
8	52"	Subgrade ?	Split spoon 30 blows 1.5'
9	64"	Auger - dk brn clayey coarse gravel	29" - 46" sample (29"-34")
10	H ₂ O 9' 4" ▽ 9:40 AM		Sample 34"-52"
11			
12	11.5'	org brn - brn sandy, clayey gravel	Sample 52"-64"
13		Subgrade	
14			
15		coarse gravel w minor cly dk brn	Sample at 100"
16			
17	16.0'	finer clayey gravel dk brn	
18		coarse gravel w/ minor dk brn cly	
19	18.5'		
20	19.0'	finer clayey gravel lrbuff sandy clay wet/sat.	

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____-____-19____
 Date

SHRP REGION _____
 STATE MT

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____

LTPP EXPERIMENT Condon N ROUTE/HIGHWAY P-83 Lane _____ Direction NB

SAMPLE/TEST: (a) Before Section _____ (b) After Section #2 FIELD SET NO. _____

LOG OF SHOULDER PROBE

OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1

AUGERING DATE 4-18-02 LOCATION STATION: RP 43.45 (S. End) AUGER PROBE NUMBER _____

TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	5.5"	PMS	
2	9.0"	Pulverized BC	Split Spoon 51 blows 1.5'
3	14.0"	Pulverized Base Course	Sample 5.5" - 14.5"
4	36"	Existing Base	
5			Split Spoon @ 20"
6		dk brn w/ org cast coarse gravel w/ sandy clay fines	28 blows 1.5' Sample 18" - 32"
7			Sample 20" - 32"
8		locally very coarse gravel > 1.5-2.0"	Split Spoon @ 32"
9			20 Blows 1.5" NS
10			32" - 50" Sample
11			Sample 50" - 85"
12			
13	13		
14		dk brn sandy clay some gravel	
15			
16			
17			
18	18		
19		damp-wet sticky tan plastic clay w/ fine gravel	
20			

2x
sq.

REFUSAL WITHIN 20 FEET (Y/N): N

DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____-____-19____
 Date

Project No. _____ Control No. 8021

Project Name RESEARCH PROJ Sta.: COWDON

Core Log. No. CL-3-20-02 Hole No. 2

Driller MATBERRY Crew JOHN-SAM Geotech WJWG 800

Date 4/18/02 Drill Simon Shelby's _____ # Bag Samples _____

Drilling Method - Augers 8" Casing _____ /Size _____ /Bit F6R

Elev. _____ Water Level 140 Pipe Installed _____

Comments:

<u>0.0-- ASPHALT 15.5</u>	SPT/SHELBY'S	PSI	RATE
<u>DK BROWN SANDY</u>	<u>05-2.0</u>	<u>SS</u>	
<u>GRAVEL</u>	<u>14" BAG</u>		
<u>20.0</u>	<u>14" 32"</u>	<u>SS</u>	
<u>SOIL</u>	<u>32" BAG</u>		
	<u>28" - 36"</u>	<u>SS</u>	
	<u>50" BAG</u>		
	<u>86" BAG</u>		
	<u>DRILLED TO 20 DO SAMPLE</u>		

63687

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Condon
 Longitude: 113°44' W
 Latitude: 47°33' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/18/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH
CRACKING			
1 FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2 BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3 EDGE CRACKING (METERS)	0.0	0.0	0.0
4 LONGITUDINAL CRACKING			
4a. Wheelpath (Meters)	1.6	0.0	0.0
Length Sealed (Meters)	0.0	0.0	0.0
4b. Non-Wheelpath (Meters)	15.0	0.0	0.0
Length Sealed (Meters)	0.0	0.0	0.0
5 REFLECTION CRACKING AT JOINTS	Not Recorded		
6 TRANSVERSE CRACKING			
Number of Cracks	0	0	0
Length (Meters)	0.0	0.0	0.0
Length Sealed	0.0	0.0	0.0
PATCHING AND POTHOLES			
7 PATCH / PATCH DETERIORATION (Number)	0	0	0
(Square Meters)	0.0	0.0	0.0
8 Potholes (Number)	0	0	0
(Square Meters)	0.0	0.0	0.0

Location: Condon
 Longitude: 113°44' W
 Latitude: 47°33' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/18/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10	SHOVING (Number)	0
	(Square Meters)	0.0

SURFACE DEFECTS

11	BLEEDING (Square Meters)	0.0
----	-----------------------------	-----

12	POLISHED AGGREGATE (Square Meters)	0.0
----	---------------------------------------	-----

13	RAVELING (Square Meters)	0.0
----	-----------------------------	-----

MISCELLANEOUS DISTRESSES

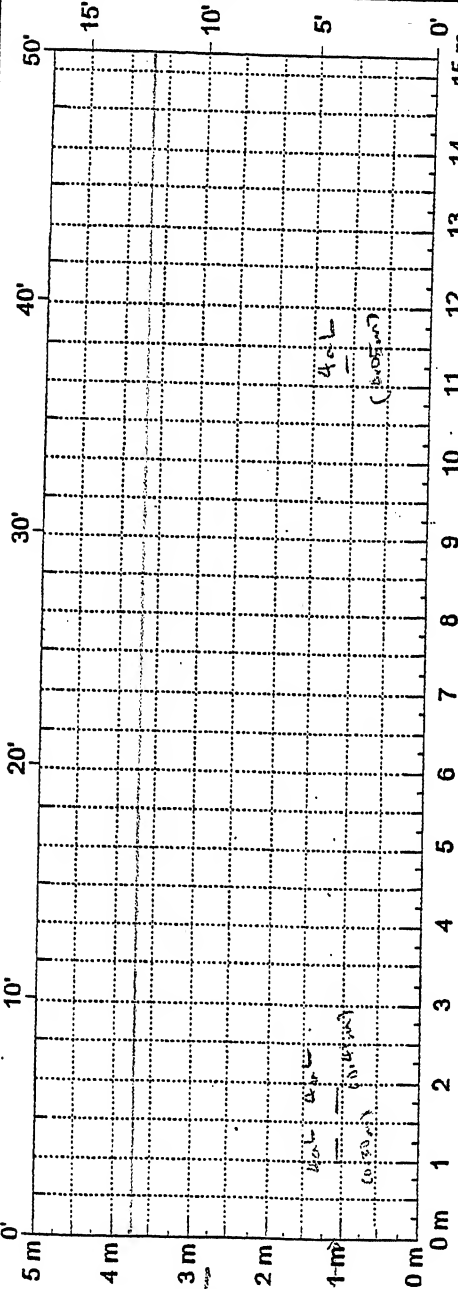
14 LANE-TO-SHOULDER DROPOFF - Not Recorded

15	WATER BLEEDING AND PUMPING (Number)	0
	Length of Affected Pavement (Meters)	0.0

16 OTHER (Describe) snow plough damage on shoulder stripe throughout section

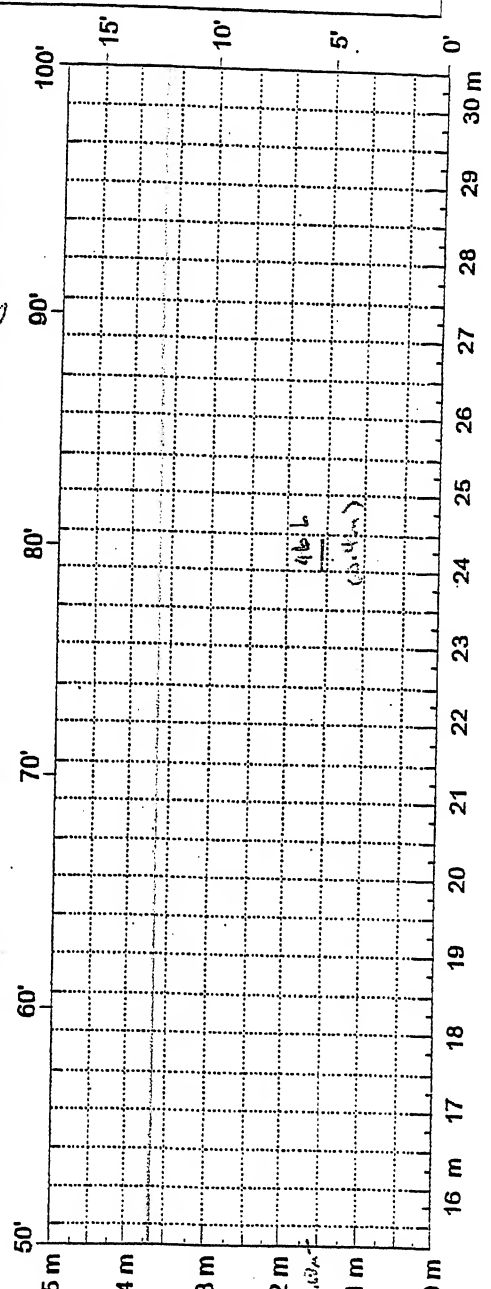
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Surveyors: WT (BS)
 Date: 4/19/02
 Pavement Temp: _____
 Before _____ After _____



Section Summary
 4.6L = 0.760m
 + 0.135m
 4.6L = 1.520m
 4.6L = 0.400m + 6.11m + 2m
 + 8.49m
 4.6L = 15.00m

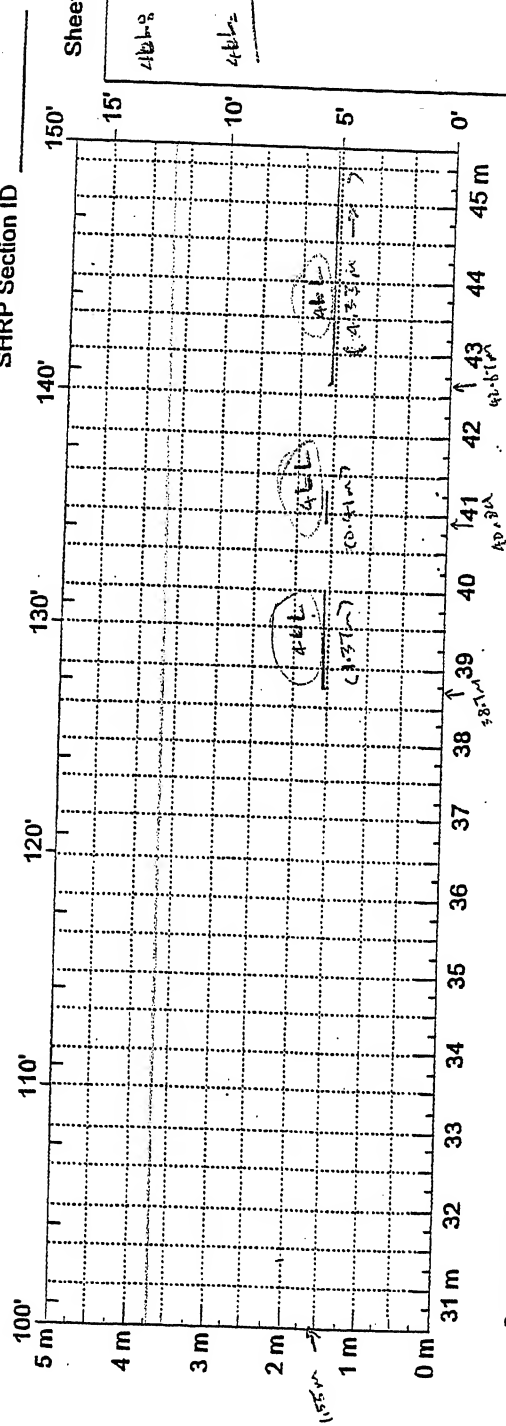
Comments: Snow plough damage on outer slope throughout the section.



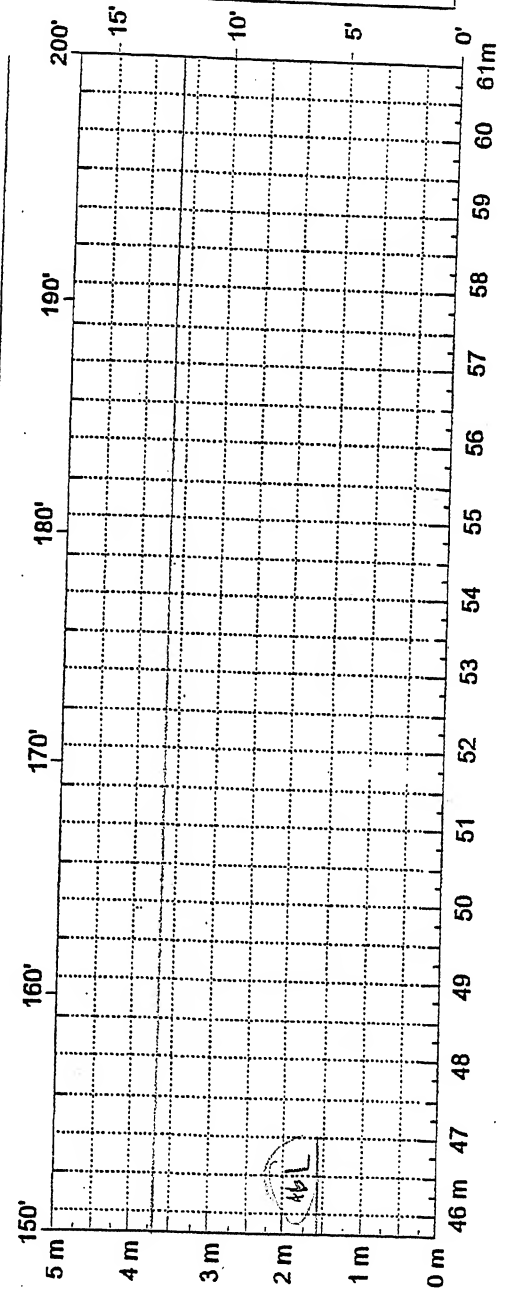
Comments: _____

Sheet Summary
 4.6L = 0.30 + 1.641 + 0.135
 4.6L = 0.760m
 4.6L = 0.760m

Reviewer: _____ State Assigned ID _____
 Surveyors: NT/BS State Code _____
 Date: 4/18/02 SHRP Section ID _____



Comments: _____



Comments: _____

Sheet Summary

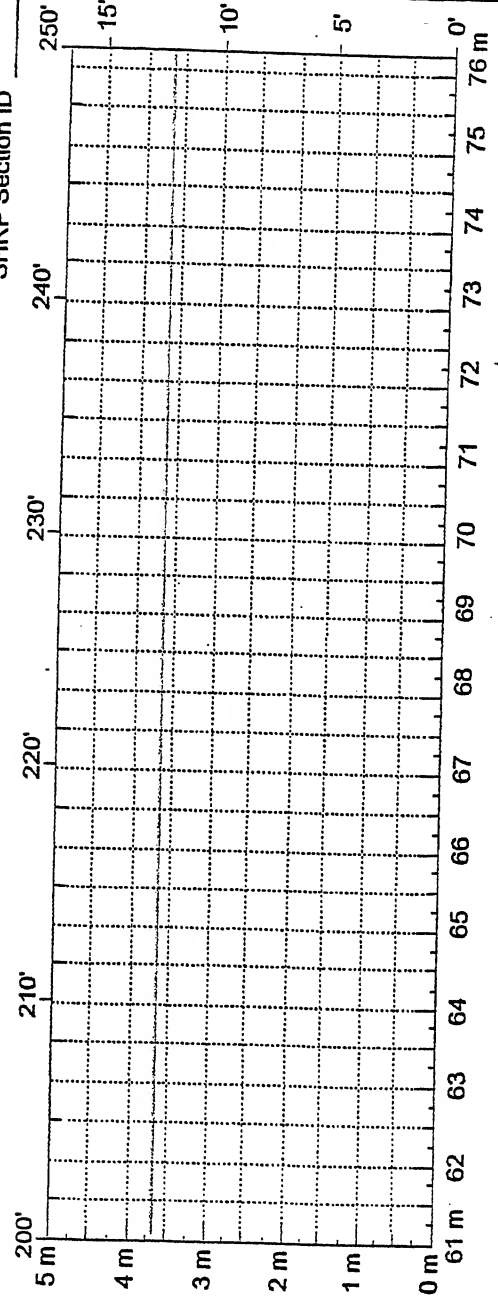
4668	1.374
4669	0.414
4670	4.523
4671	6.11 m

State Assigned ID _____
State Code _____

Reviewer: _____
Date: _____

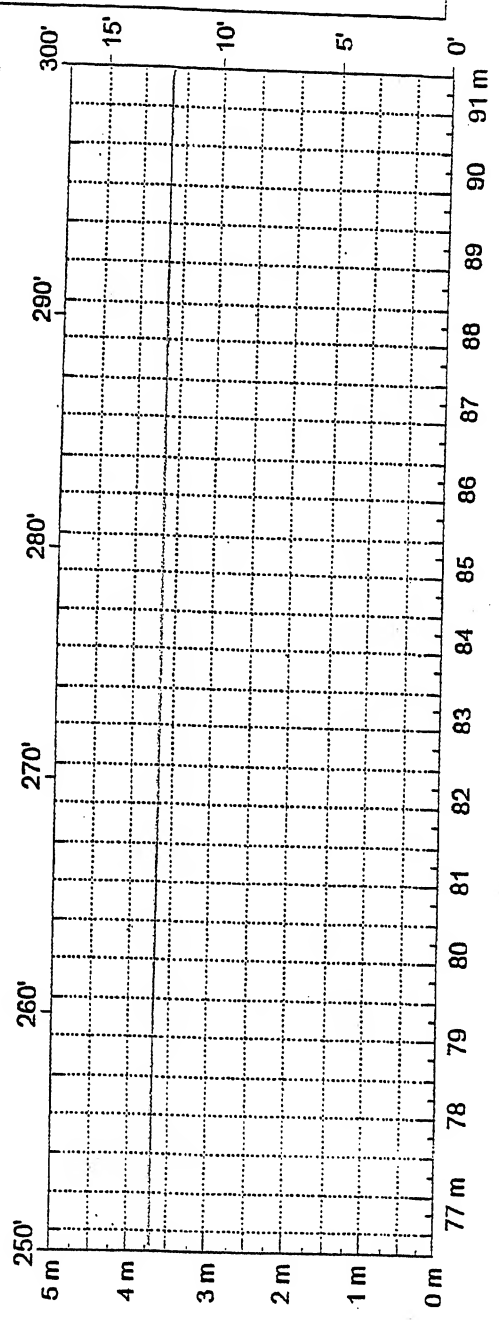
Surveyors: WT/ES
Date: 4/2/02

SHRP Section ID _____



Comments: _____

Sheet Summary
NONE

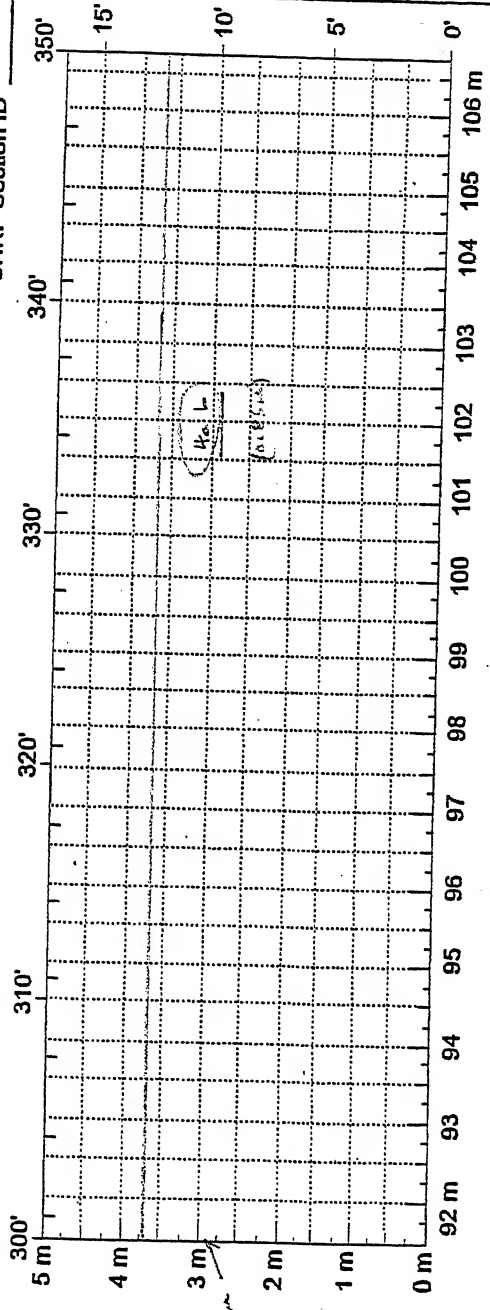


Comments: _____

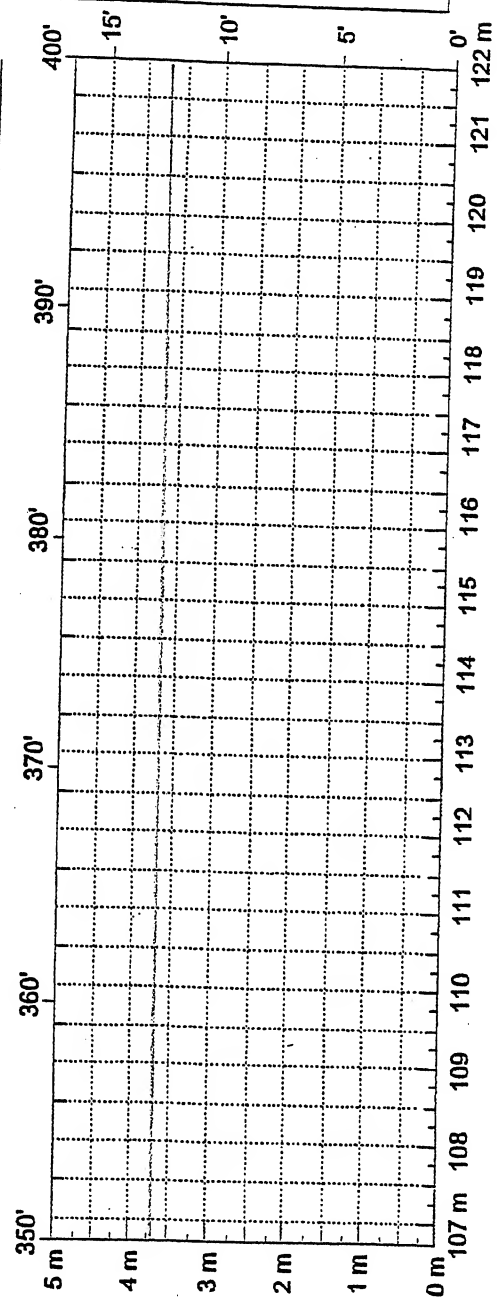
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____

Surveyors: WJ / RS
 Date: 4/19/07



Comments: _____



Comments: _____

Sheet Summary

April 19, 2007

State Assigned ID _____

State Code _____

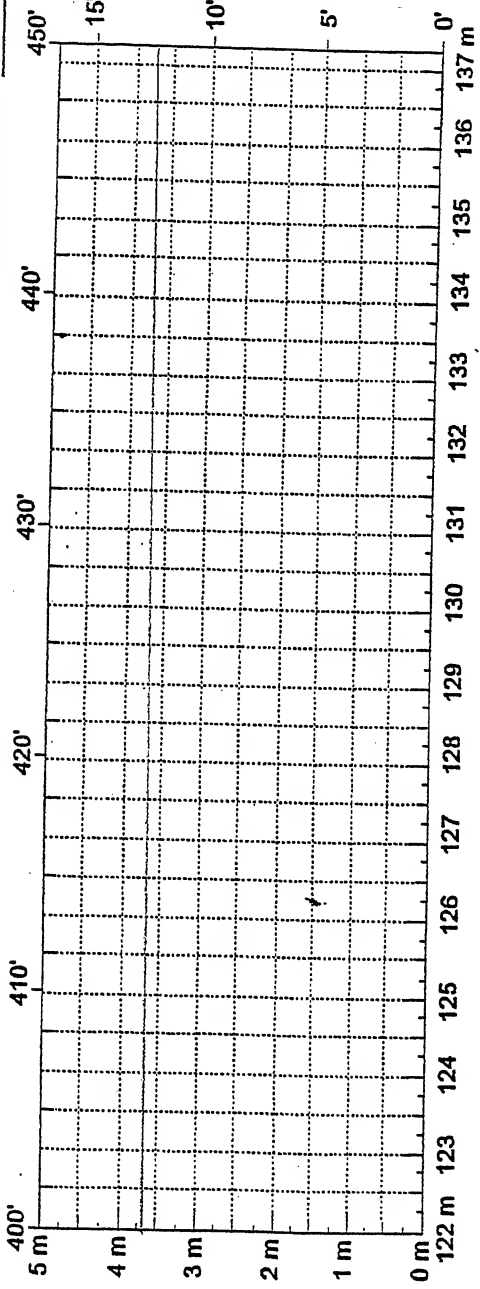
SHRP Section ID _____

Pavement Temp: _____

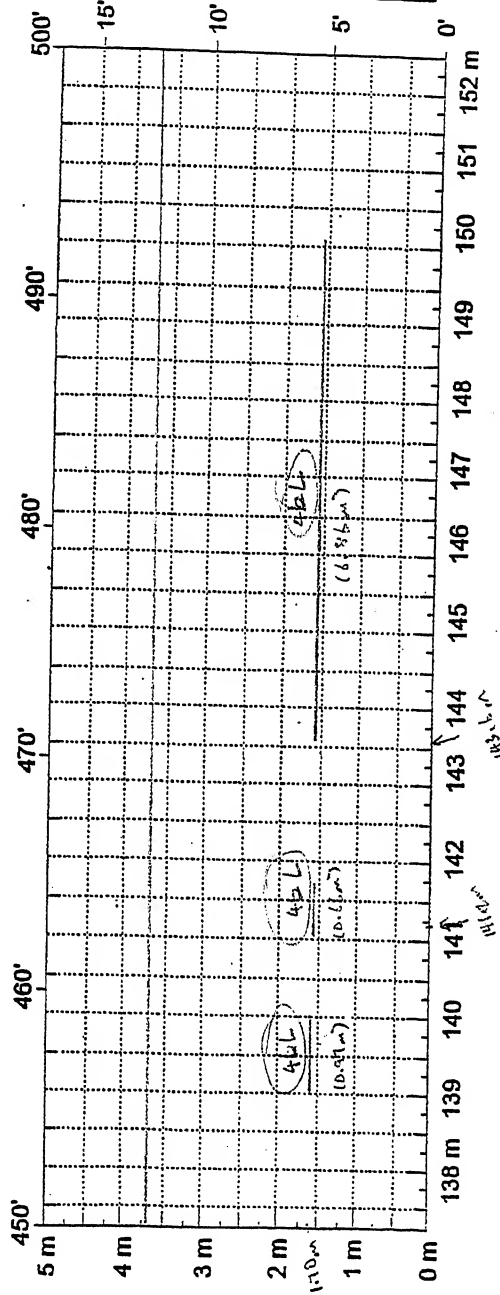
After _____

Reviewers: NS/LS

Date: 4/18/02



Comments: _____



Comments: _____

Sheet Summary

46L 0.174
 2.564
 6.826
 46L 2.49 m

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Condon
 Longitude: 113°44' W
 Latitude: 47°33' N

FWD Data

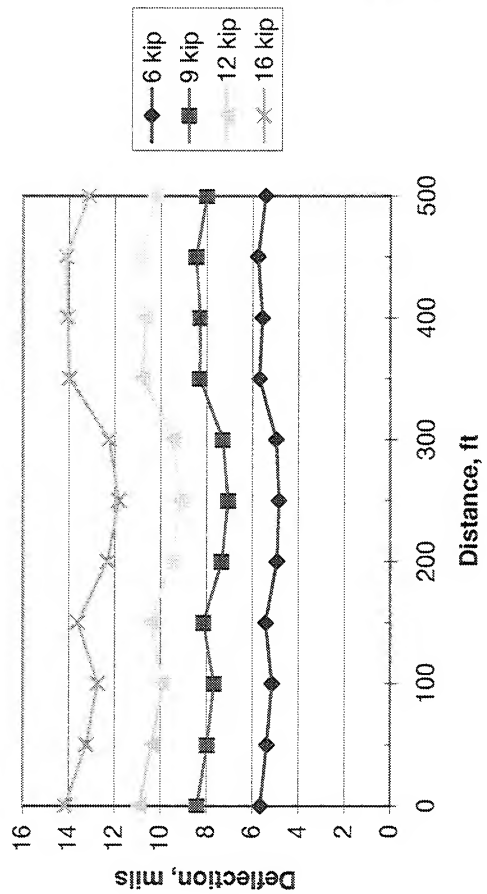
Test Date: 10/8/01

Layer	Material Type	Average Thickness in.
1	ACP	5.4
2	Pulverized	9.0
3	Base	24.1
4	Subgrade	-

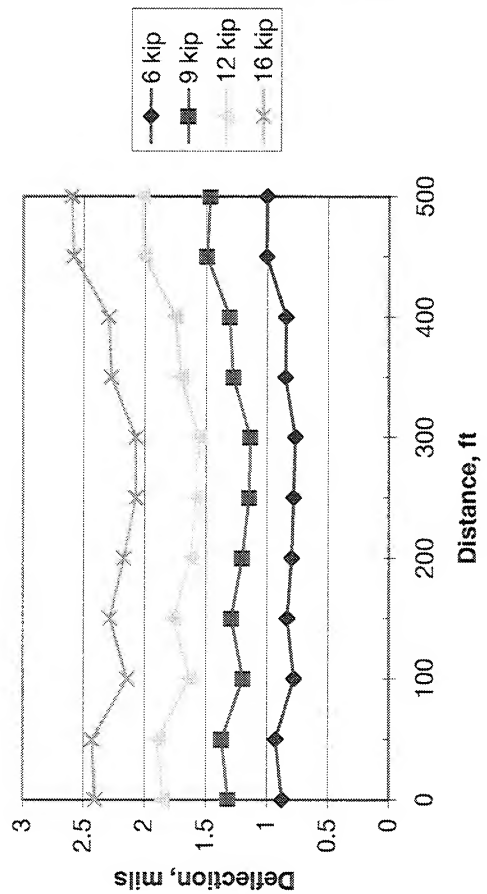
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	6.92	6.52	5.26	4.36	3.28	2.49	1.53	1.01
0+00	9.77	9.11	7.49	6.27	4.77	3.62	2.19	1.43
0+00	12.33	11.21	9.25	7.74	5.97	4.54	2.84	1.90
0+00	15.51	13.72	11.28	9.49	7.40	5.62	3.48	2.33
0+50	6.87	6.14	4.99	4.17	3.26	2.46	1.54	1.06
0+50	9.74	8.60	7.00	5.91	4.56	3.50	2.21	1.48
0+50	12.13	10.48	8.58	7.26	5.66	4.34	2.77	1.91
0+50	15.50	12.81	10.50	8.90	7.00	5.36	3.46	2.35
1+00	6.87	5.88	4.67	3.84	2.87	2.14	1.32	0.89
1+00	9.63	8.20	6.58	5.42	4.11	3.07	1.89	1.28
1+00	12.24	10.07	8.20	6.74	5.15	3.87	2.43	1.66
1+00	15.55	12.37	9.99	8.31	6.34	4.83	3.04	2.08
1+50	6.84	6.18	4.96	4.13	3.16	2.37	1.44	0.95
1+50	9.70	8.75	7.10	5.96	4.58	3.46	2.11	1.39
1+50	12.18	10.59	8.69	7.33	5.67	4.30	2.66	1.79
1+50	15.56	13.22	10.77	9.12	7.11	5.40	3.41	2.22
2+00	6.79	5.58	4.48	3.71	2.86	2.15	1.34	0.90
2+00	9.60	7.81	6.40	5.34	4.11	3.12	1.97	1.28
2+00	12.16	9.63	7.89	6.58	5.13	3.90	2.51	1.64
2+00	15.51	11.92	9.74	8.20	6.41	4.90	3.09	2.10
2+50	6.83	5.51	4.39	3.60	2.76	2.06	1.29	0.89
2+50	9.75	7.63	6.17	5.09	3.88	2.95	1.83	1.24
2+50	12.15	9.28	7.55	6.27	4.82	3.68	2.31	1.60
2+50	15.53	11.47	9.35	7.74	6.00	4.59	2.91	2.01

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	6.72	5.56	4.40	3.63	2.76	2.09	1.25	0.86
3+00	9.59	7.76	6.32	5.19	3.99	3.03	1.86	1.21
3+00	12.08	9.54	7.82	6.44	5.00	3.78	2.32	1.57
3+00	15.37	11.76	9.69	7.95	6.24	4.74	2.97	1.99
3+50	6.78	6.43	5.02	4.06	3.08	2.27	1.40	0.96
3+50	9.66	8.90	7.15	5.76	4.38	3.27	2.02	1.37
3+50	12.19	10.98	8.84	7.18	5.52	4.11	2.50	1.73
3+50	15.35	13.40	10.69	8.83	6.84	5.11	3.16	2.18
4+00	6.75	6.27	5.03	4.15	3.16	2.36	1.44	0.95
4+00	9.59	8.81	7.15	5.90	4.51	3.41	2.15	1.39
4+00	12.07	10.74	8.82	7.32	5.61	4.27	2.68	1.76
4+00	15.42	13.54	10.89	9.04	6.93	5.33	3.35	2.21
4+50	6.70	6.44	5.27	4.38	3.43	2.61	1.63	1.12
4+50	9.54	8.96	7.45	6.25	4.86	3.74	2.34	1.58
4+50	12.21	11.06	9.31	7.83	6.14	4.73	2.96	2.04
4+50	15.25	13.45	11.36	9.51	7.49	5.76	3.66	2.46
5+00	6.83	6.18	5.05	4.18	3.27	2.51	1.65	1.14
5+00	9.64	8.57	7.10	5.90	4.64	3.58	2.30	1.57
5+00	12.15	10.34	8.78	7.22	5.69	4.47	2.91	2.04
5+00	15.46	12.68	10.63	8.85	7.01	5.50	3.58	2.51

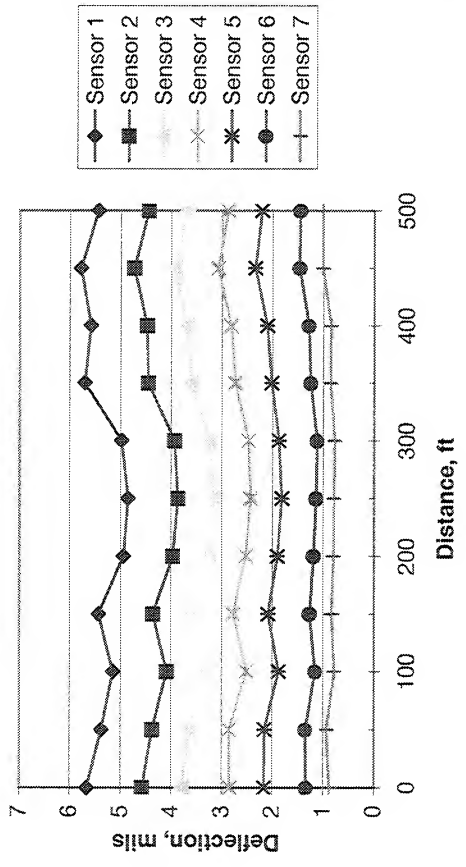
Condon, Sensor 1 Deflections



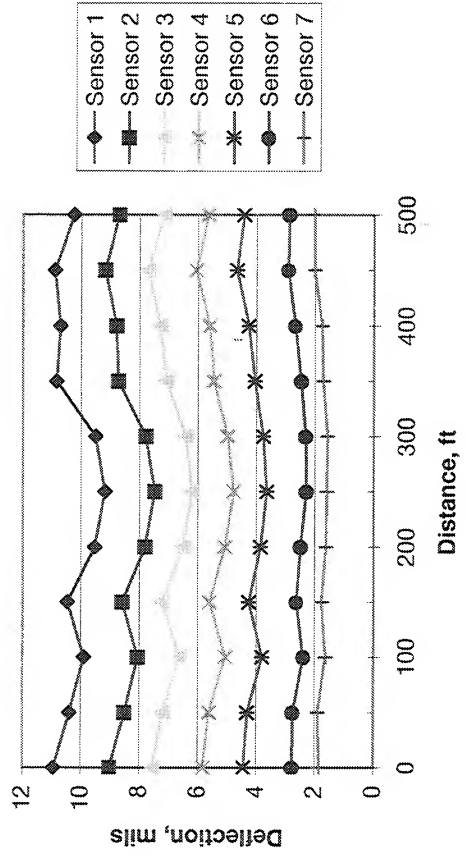
Condon, Sensor 7 Deflections



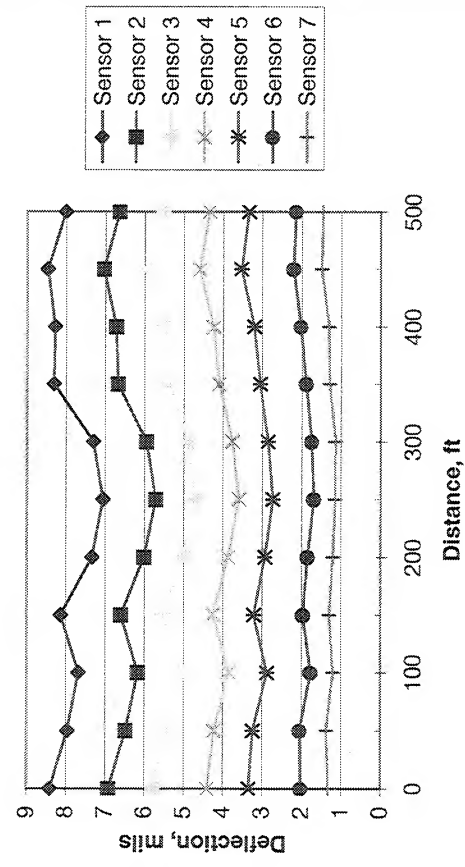
Condon, 6,000-lb Load



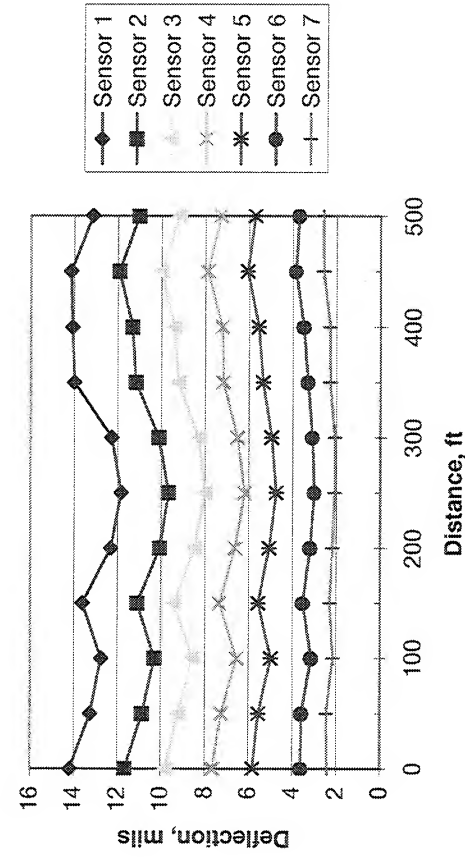
Condon, 12,000-lb Load



Condon, 9,000-lb Load



Condon, 16,000-lb Load



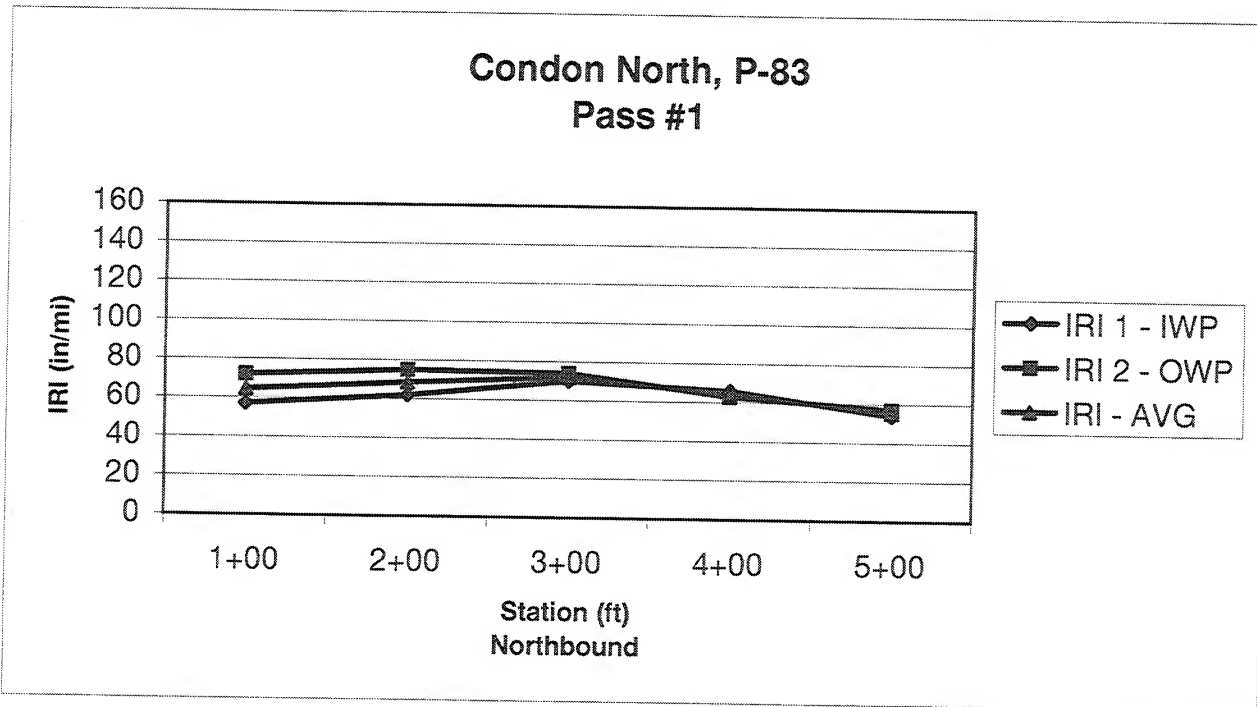
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Condon
 Longitude: 113°44' W
 Latitude: 47°33' N

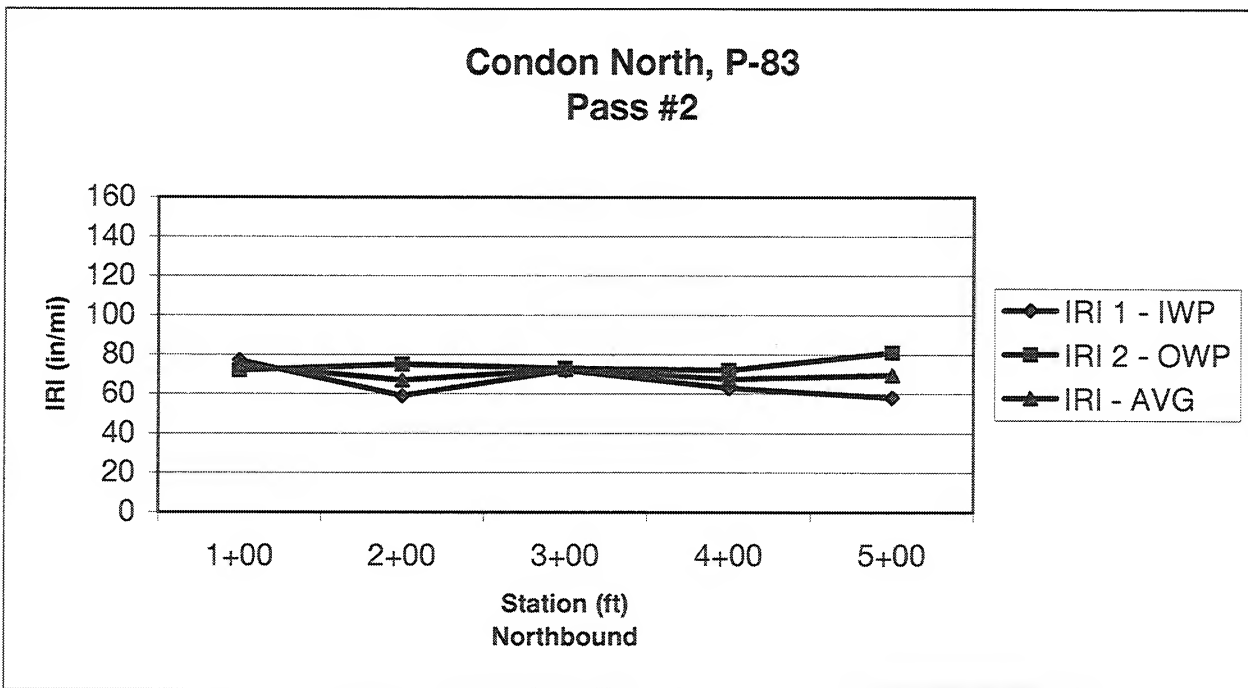
Profile Data

Test Date: 10/15/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.18	0.020	57	72	65
2+00	100	200	100	0.16	0.021	62	75	69
3+00	200	300	100	0.16	0.025	70	74	72
4+00	300	400	100	0.20	0.023	66	63	65
5+00	400	500	100	0.18	0.023	54	57	56
AVG.				0.170	0.022	61.8	68.2	65.0
STD.				0.017	0.002	6.496	7.855	6.164

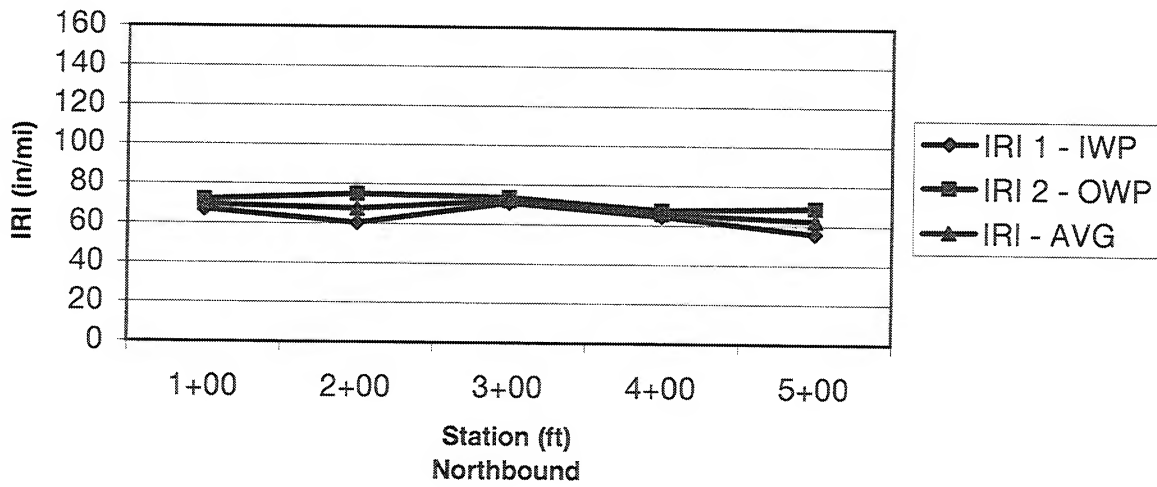


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.11	0.021	77	72	75
2+00	100	200	100	0.13	0.023	59	75	67
3+00	200	300	100	0.15	0.029	72	73	73
4+00	300	400	100	0.20	0.020	63	72	68
5+00	400	500	100	0.18	0.029	58	81	70
AVG.				0.154	0.024	65.8	74.6	70.2
STD.				0.036	0.004	8.349	3.782	3.233



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.15	0.021	67	72	70
2+00	100	200	100	0.15	0.022	61	75	68
3+00	200	300	100	0.16	0.027	71	74	72
4+00	300	400	100	0.20	0.022	65	68	66
5+00	400	500	100	0.18	0.026	56	69	63
AVG.				0.165	0.023	63.8	71.4	67.6
STD.				0.024	0.003	5.794	3.110	3.668

**Condon North, P-83
average - all passes**



APPENDIX E

HAMMOND

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Hammond
 Longitude: 105°09' W
 Latitude: 45°19' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	4.7	3.1	3.9	Chip Seal
2	CSB	5.5	7.0	6.3	
3	Base	6.0	4.5	5.3	Orange-Brwn w/Red-Orange Flakes. Sand w/Fine Grvl.
4	Subgrade	-	-	-	Sandy Silty Clay

Materials Sampling

Date: 4/23/02

Material Type	Quantity	Comments
ACP / CSB	14 cores	2-10" & 12-6" cores
CSB	1 bag	ACP/CSB cores
Base	1 bag	
Subgrade	4 shelby, 2bags	1 splitspoon

SHRP REGION _____ STATE CODE _____
 STATE NY FIELD MATERIAL SAMPLING AND FIELD TESTING
 LTPP EXPERIMENT Hammind NW ROUTE/HIGHWAY N-23 Lane _____ SHRP ASSIGNED ID _____
 SAMPLE/TEST: (a) Before Section V#1 (b) After Section _____ Direction WB
 LOG OF SHOULDER PROBE FIELD SET NO. _____
 OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 AUGERING DATE 4-23-02 LOCATION STATION: RP95A (E. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	4.5"	PMS	
2	10"	CTB	25 blows
3	16"	Exist. Base org Arn w/red org flakes sand w/fine gravel	10" to 20" Split spoon sample 4.5" - 10"
4		Subgrade	
5		gry grn sandy silty cly	Sample 16" - 19"
6		More clayey	2' SHELBY (19" - 43") Recovered (17.5")
7		and more plastic w/depth	2' SHELBY (15.25") (43" - 67") Recovered (15.25")
8			
9		gry grn highly plast cly	
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ - 19____
 Date

SHRP REGION _____
 STATE MT

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____

LTPP EXPERIMENT Hammond NW ROUTE/HIGHWAY N-23 Lane _____ Direction WB
 SAMPLE/TEST: (a) Before Section _____ (b) After Section ✓ #2 FIELD SET NO. _____

OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
LOG OF SHOULDER PROBE DCG SHEET: 08

AUGERING DATE 4 - 23 - 02 LOCATION STATION: RP 95.4 (W. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
12" <u>1</u>	<u>3"</u>	<u>PMS</u>	
24" <u>2</u>	<u>10"</u>	<u>CTB</u>	
36" <u>3</u>	<u>14.5"</u>	<u>Existing base</u>	<u>Sample 10" - 14.5"</u>
48" <u>4</u>		<u>Urban fine sand Subgrade</u>	<u>SHELBY TUBE</u>
60" <u>5</u>	<u>38.5"</u>	<u>incr. cly</u>	<u>(14.5 - 38.5")</u>
72" <u>6</u>	<u>62.5"</u>	<u>gray grn sandy silty cly</u>	<u>Recovery (16.5")</u>
<u>7</u>		<u>gray grn stiff</u>	<u>SHELBY TUBE</u>
<u>8</u>		<u>highly plastic cly</u>	<u>(38.5" - 62.5")</u>
<u>9</u>			<u>Recovery (12")</u>
<u>10</u>			
<u>11</u>			
<u>12</u>			
<u>13</u>		<u>gray grn sand inc cly</u>	
<u>14</u>		<u>gray grn stiff plastic</u>	
<u>15</u>		<u>cly</u>	
<u>16</u>			
<u>17</u>			
<u>18</u>			
<u>19</u>			
<u>20</u>			

REFUSAL WITHIN 20 FEET (Y/N): _____ DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ - 19____
 Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Hammond
 Longitude: 105°09' W
 Latitude: 45°19' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/23/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH
CRACKING			
1 FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2 BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3 EDGE CRACKING (METERS)	0.0	0.0	0.0
4 LONGITUDINAL CRACKING			
4a. Wheelpath (Meters)	0.0	0.0	0.0
Length Sealed (Meters)	0.0	0.0	0.0
4b. Non-Wheelpath (Meters)	20.5	14.9	50.7
Length Sealed (Meters)	0.0	0.0	0.0
5 REFLECTION CRACKING AT JOINTS	Not Recorded		
6 TRANSVERSE CRACKING			
Number of Cracks	6	0	0
Length (Meters)	22.8	0.0	0.0
Length Sealed	0.0	0.0	0.0
PATCHING AND POTHOLES			
7 PATCH / PATCH DETERIORATION (Number)	0	0	0
(Square Meters)	0.0	0.0	0.0
8 Potholes (Number)	0	0	0
(Square Meters)	0.0	0.0	0.0

Location: Hammond
 Longitude: 105°09' W
 Latitude: 45°19' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/23/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE _____ SEVERITY LEVEL N/A

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10 SHOIVING
 (Number)
 (Square Meters)

SURFACE DEFECTS

11 BLEEDING
 (Square Meters)

12 POLISHED AGGREGATE
 (Square Meters)

13 RAVELING
 (Square Meters)

MISCELLANEOUS DISTRESSES

14 LANE-TO-SHOULDER DROPOFF - Not Recorded

15 WATER BLEEDING AND PUMPING
 (Number)
 Length of Affected Pavement
 (Meters)

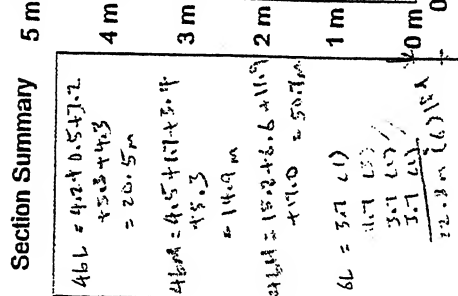
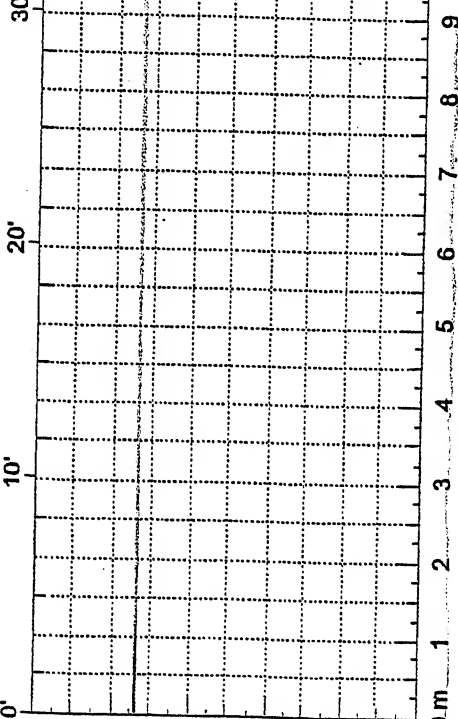
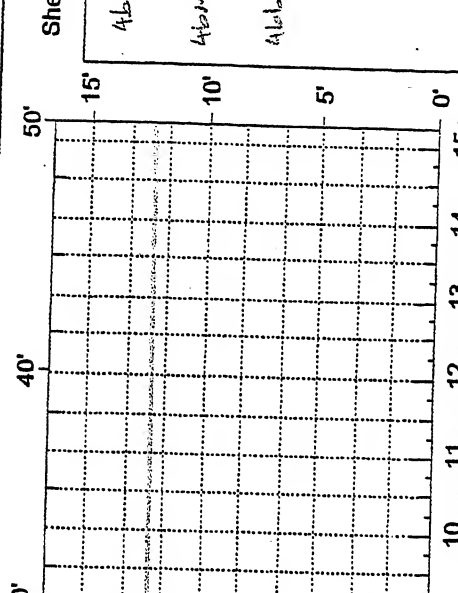
16 OTHER (Describe) Transverse cracks were sealed with some asphalt
cement but cracks are now visible again

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Pavement Temp: _____
 Before _____ After _____

Surveyors: WJ (155)
 Date: 4/23/02

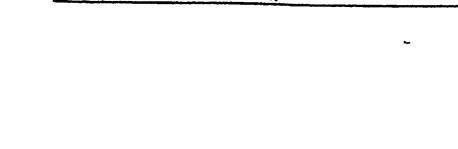
Reviewer: _____
 Date: _____



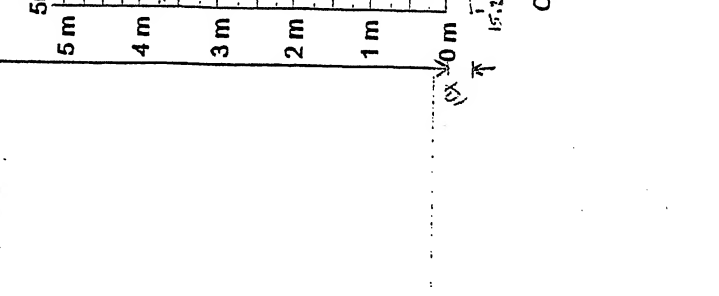
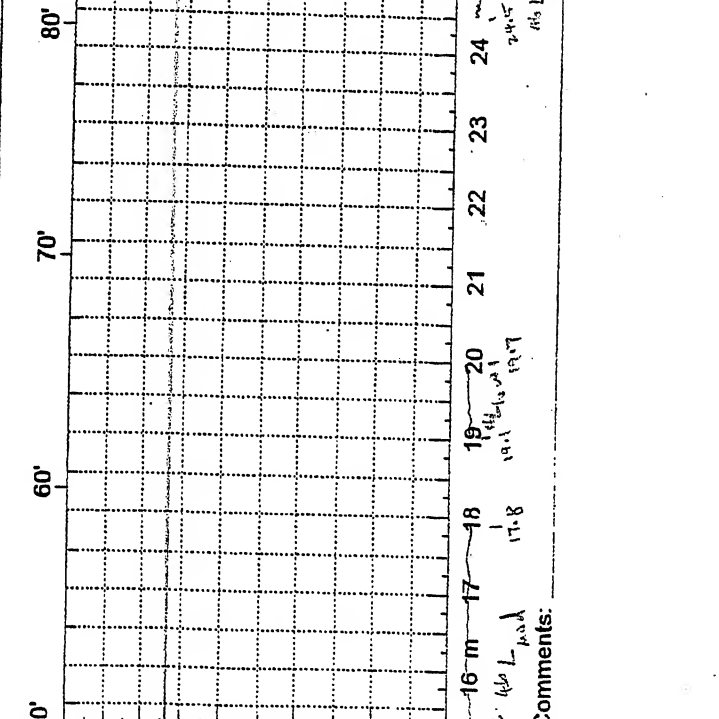
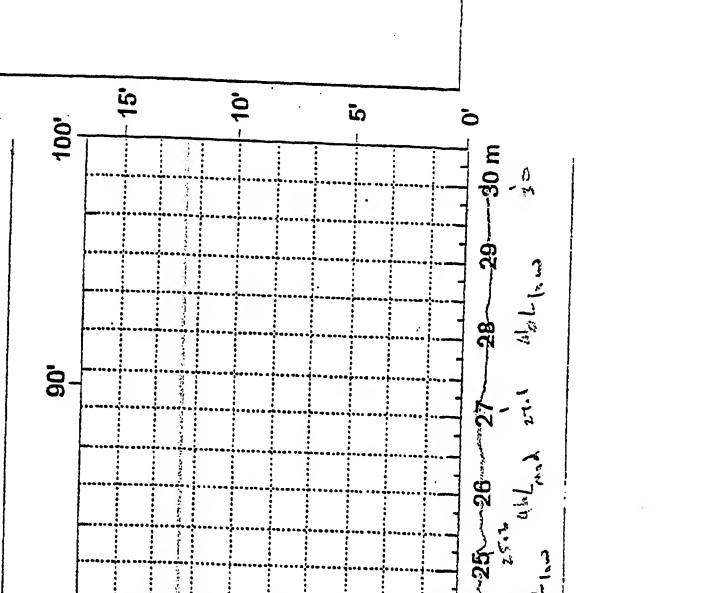
Comments: _____

Comments: _____

Comments: _____



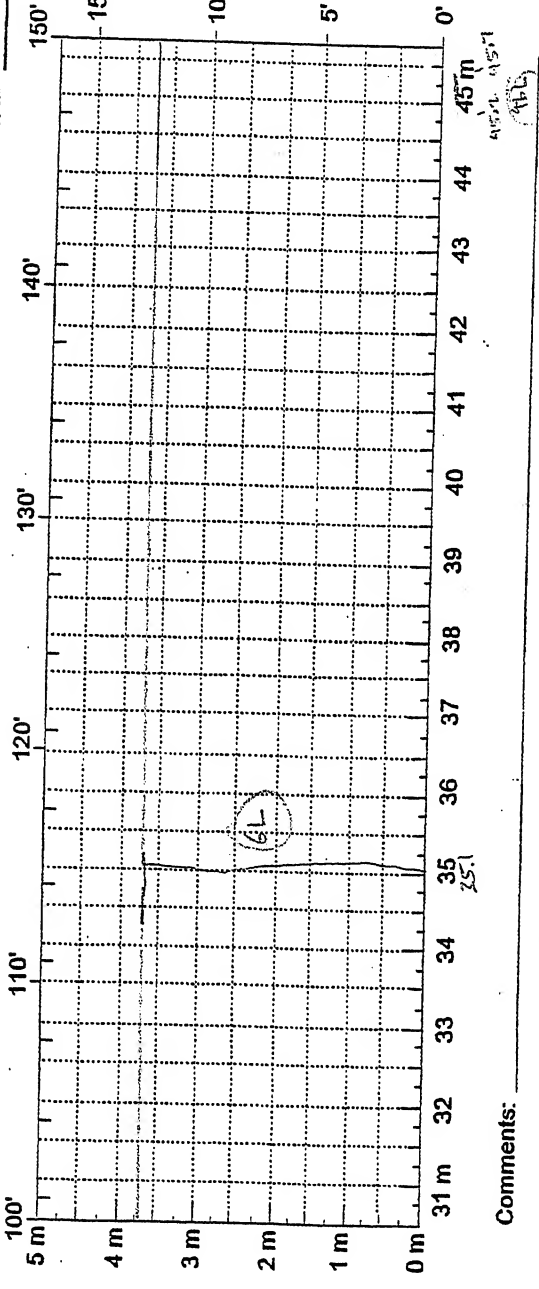
Comments: _____



Comments: _____

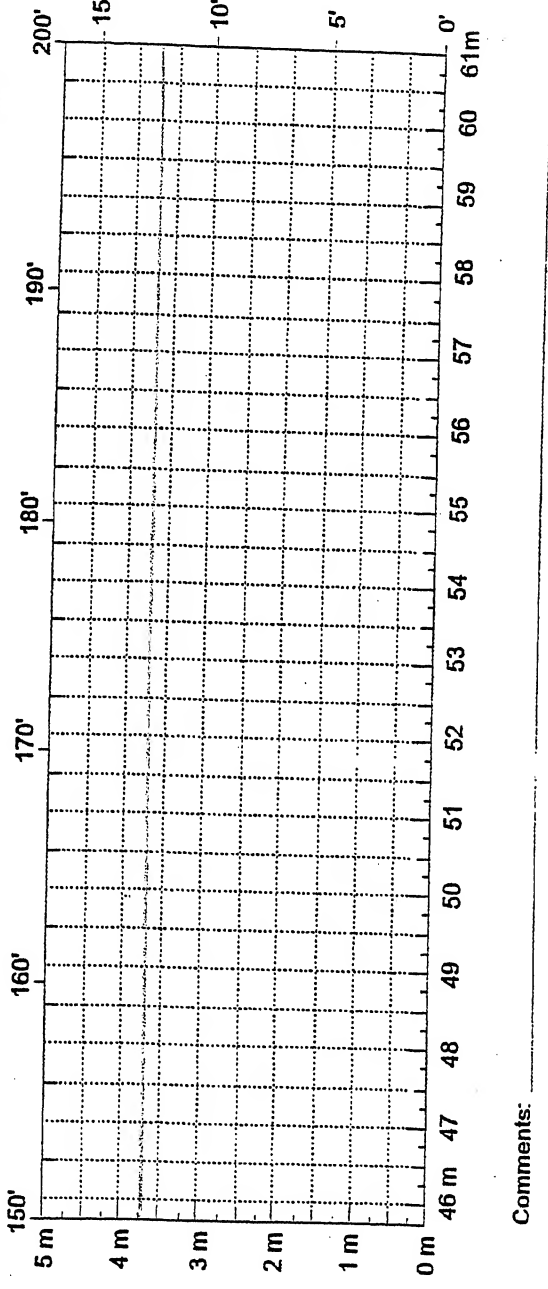
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____
 Surveyors: LT/ES
 Date: 4/23/02



Comments: _____

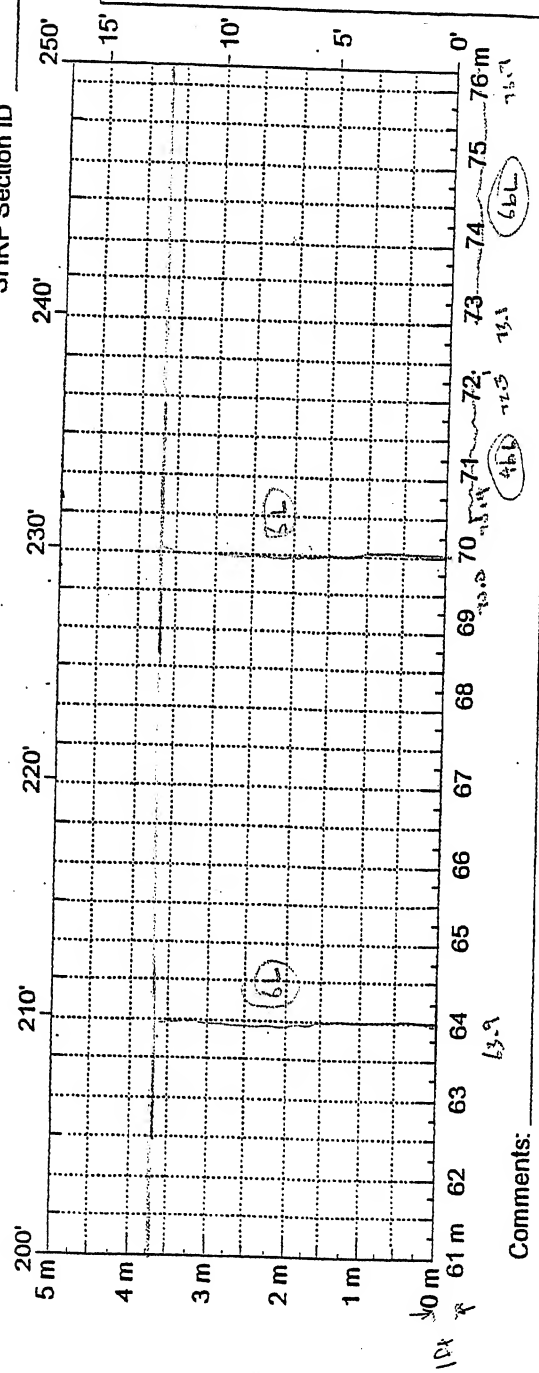
Sheet Summary
 411L = 0.5m
 6L = 0.5m (17)



Comments: _____

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

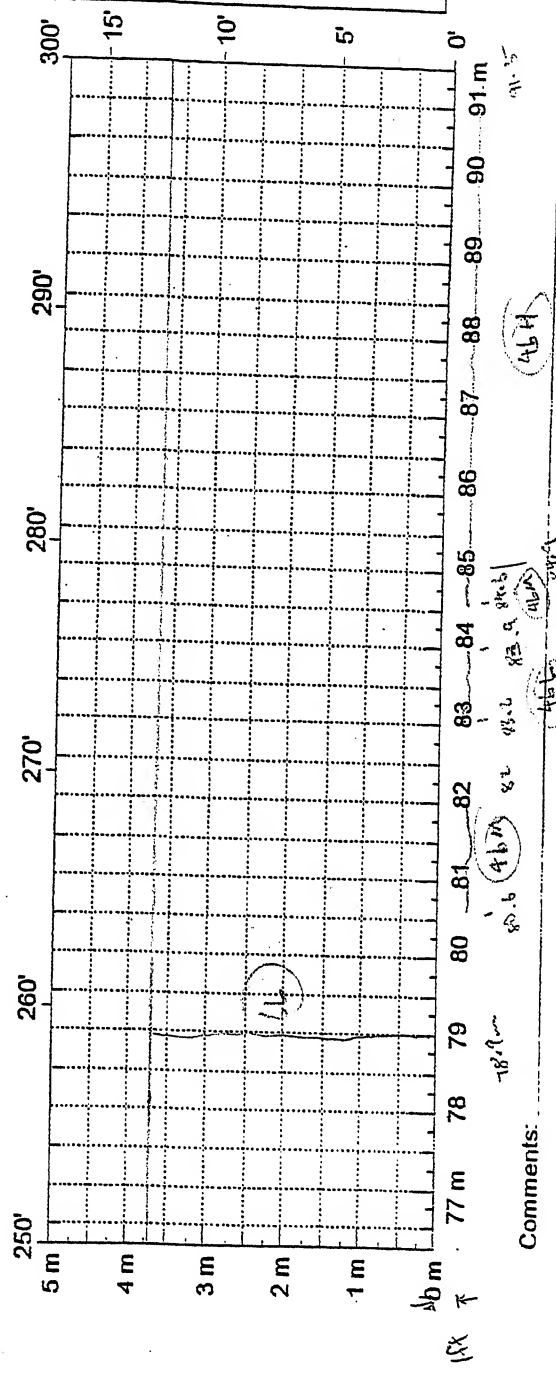
Reviewer: _____
 Surveyors: NT / BS
 Date: 4/23/02



Sheet Summary

$6L = 3.74 + 3.7 + 3.7 = 11.14m$
 $46L = 1.9 + 3.5 + 1.7 = 7.1m$
 $46A = 1.4 + 0.3 = 1.7m$
 $46A = 6.6m$

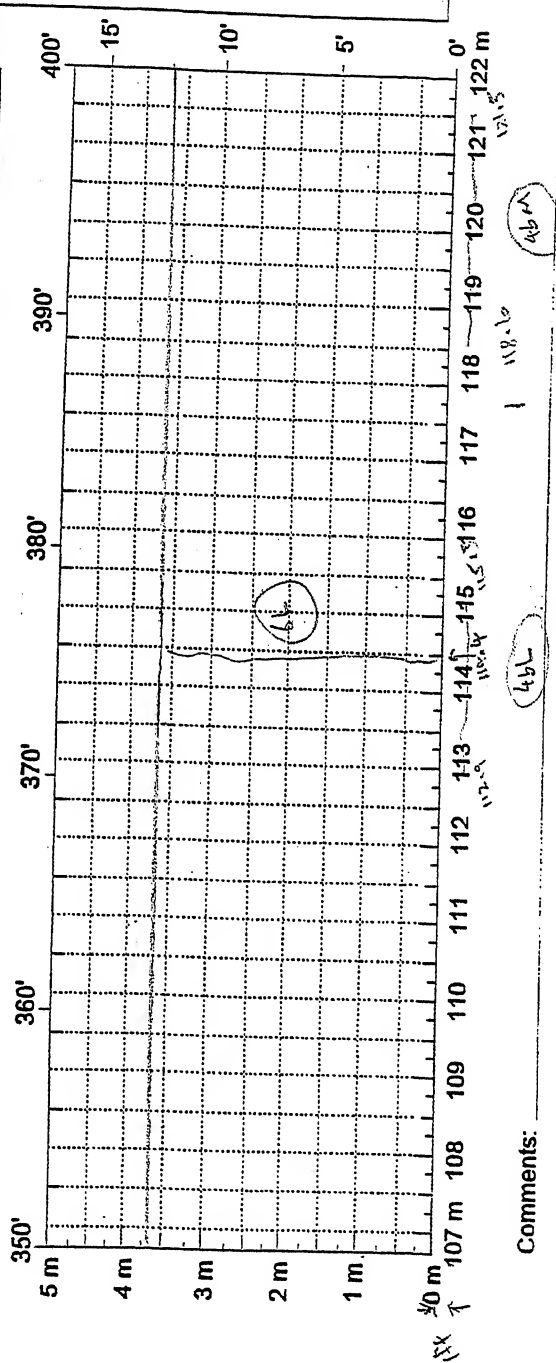
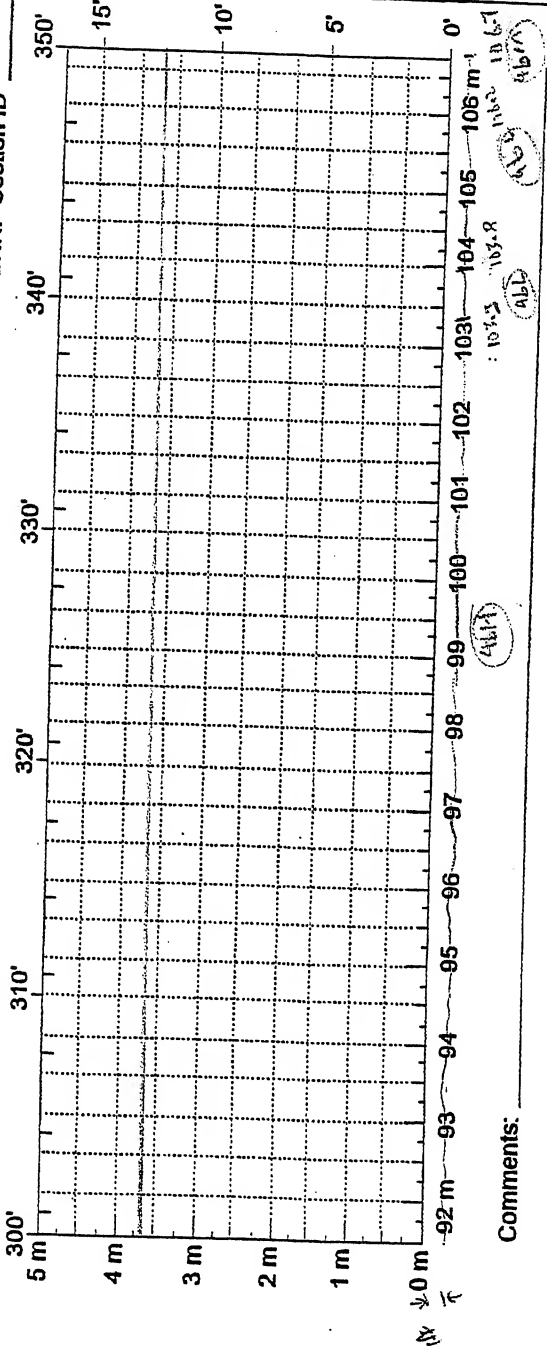
Comments: _____



Comments: _____

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: 4/23/02
 Surveyors: WT/ES

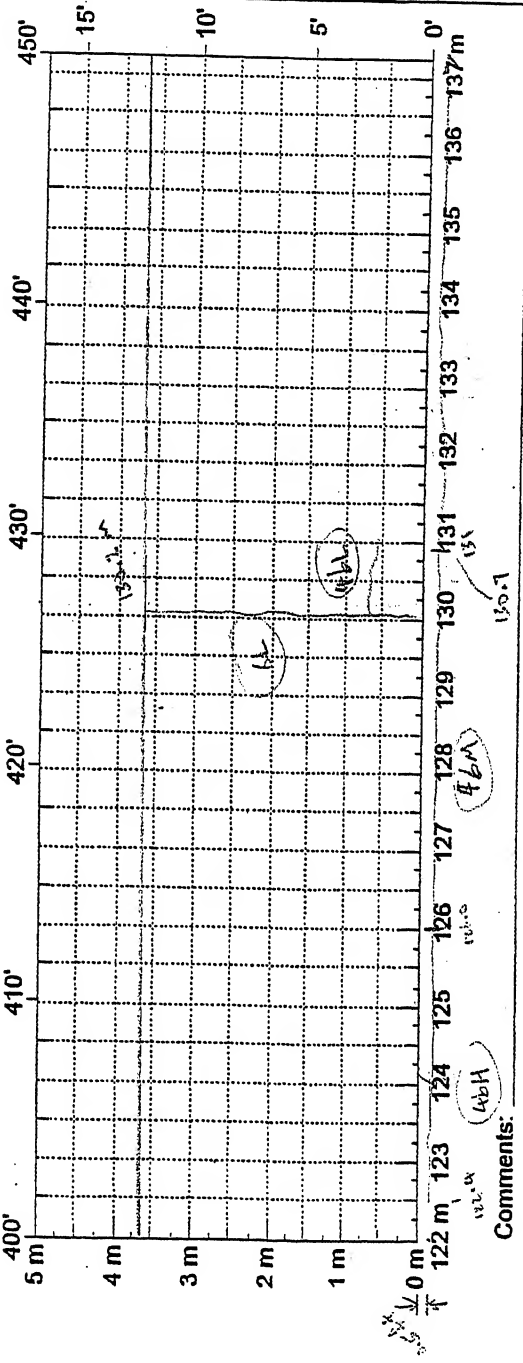


Sheet Summary

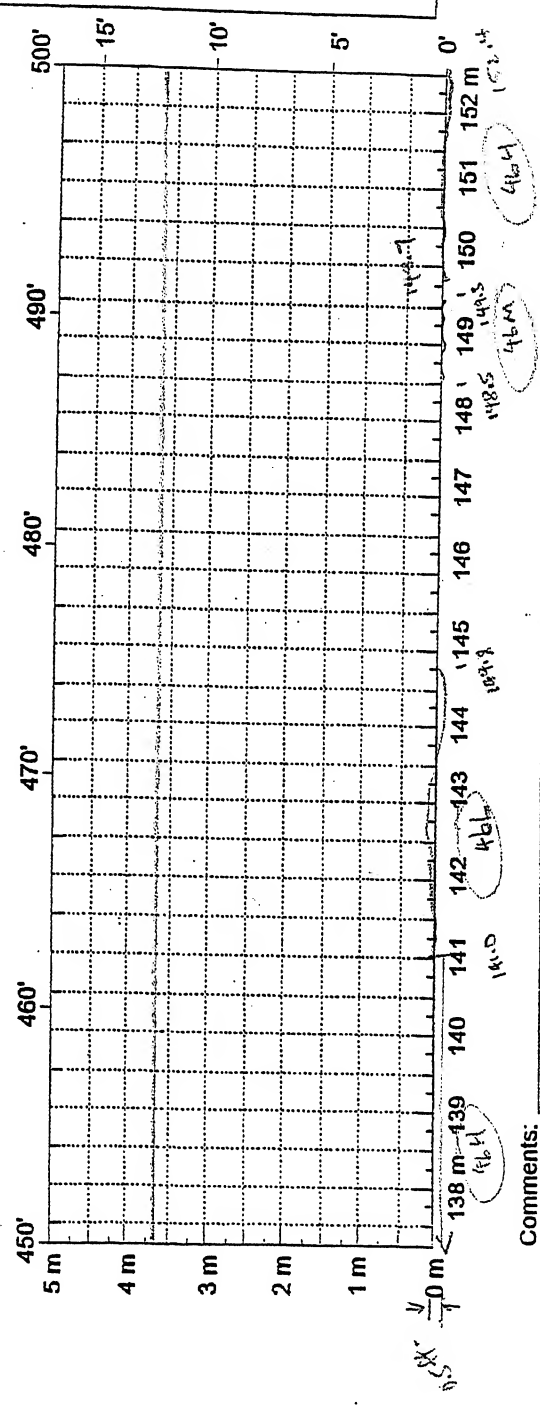
$6L = 31.00$ (1)
 $461A = 11.09$
 $461B = 20.5 + 7.9 = 28.4$
 $461C = 20.5 + 21.9 + 2.4 = 53.6$

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: 4/23/02
 Surveyors: WJ (13)
 Pavement Temp: _____
 After _____



Comments:



Comments:

Sheet Summary

$6L = 3.7m (1)$
 $4bL = 0.5 \times 3.8 = 4.3m$
 $4bM = 4.7 \times 0.8 = 5.5m$
 $4bM = 3.6 + 10.8 + 4.3 = 17.0m$

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Hammond
 Longitude: 105°09' W
 Latitude: 45°19' N

FWD Data

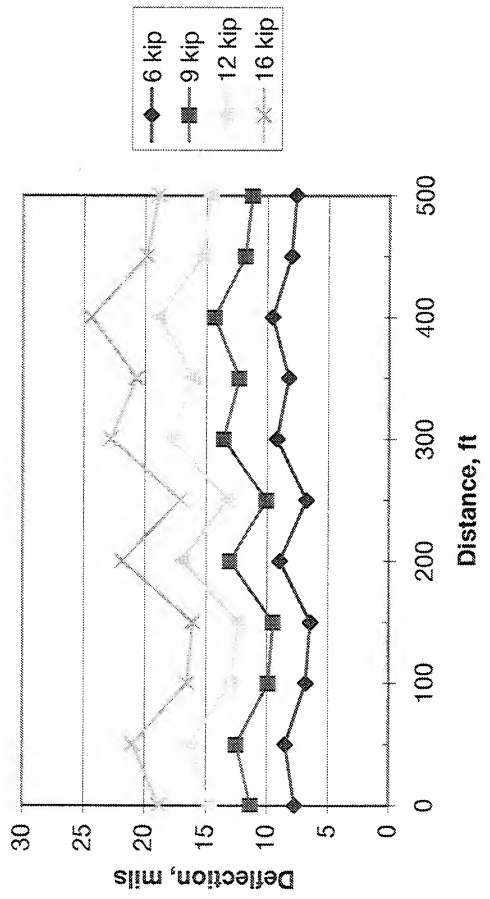
Test Date: 10/9/01

Layer	Material Type	Average Thickness in.
1	ACP	3.9
2	CSB	6.3
3	Base	5.3
4	Subgrade	-

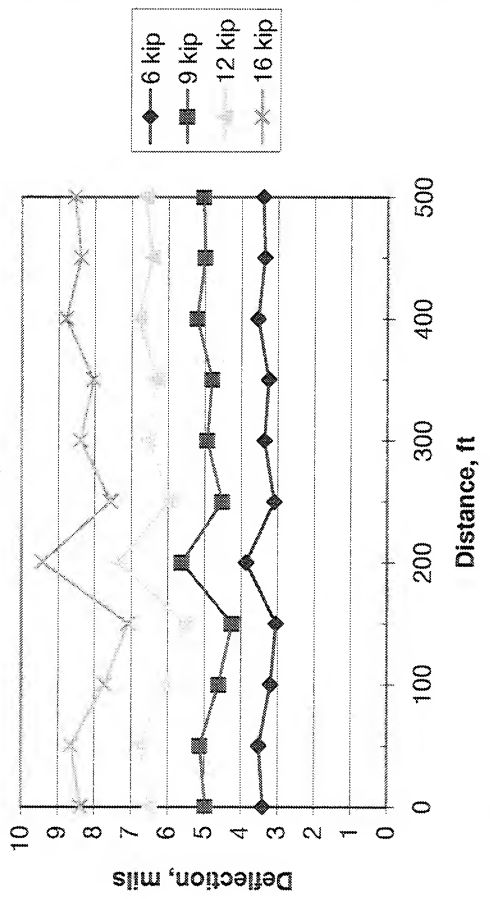
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	6.80	8.71	7.95	7.45	6.95	6.23	4.95	3.84
0+00	9.31	11.67	10.66	10.06	9.29	8.37	6.65	5.12
0+00	11.63	14.24	13.02	12.33	11.33	10.28	8.14	6.29
0+00	14.85	17.49	16.01	15.20	13.94	12.69	10.07	7.77
0+50	6.72	9.49	8.62	8.08	7.37	6.55	5.11	3.93
0+50	9.20	12.75	11.65	10.90	9.91	8.80	6.86	5.22
0+50	11.52	15.66	14.35	13.45	12.21	10.87	8.48	6.47
0+50	14.74	19.35	17.70	16.58	15.05	13.40	10.39	7.95
1+00	6.75	7.64	7.18	6.71	6.21	5.58	4.56	3.58
1+00	9.28	10.18	9.63	8.98	8.30	7.48	6.04	4.74
1+00	11.67	12.57	11.85	11.14	10.24	9.26	7.42	5.88
1+00	15.02	15.52	14.68	13.76	12.67	11.39	9.15	7.24
1+50	6.69	7.17	6.59	6.12	5.67	5.09	4.17	3.38
1+50	9.22	9.70	8.91	8.26	7.55	6.83	5.53	4.34
1+50	11.61	11.96	10.99	10.22	9.35	8.38	6.75	5.34
1+50	14.98	15.05	13.78	12.80	11.65	10.41	8.37	6.63
2+00	6.68	9.95	9.01	8.40	7.72	6.93	5.48	4.29
2+00	9.16	13.27	12.07	11.28	10.29	9.27	7.35	5.71
2+00	11.55	16.34	14.84	13.94	12.69	11.45	9.07	7.06
2+00	14.65	20.00	18.14	17.08	15.53	14.01	11.09	8.63
2+50	6.74	7.58	6.91	6.50	6.06	5.44	4.42	3.47
2+50	9.20	10.25	9.33	8.81	8.14	7.32	5.86	4.61
2+50	11.56	12.75	11.59	10.95	10.05	9.09	7.27	5.71
2+50	14.92	15.94	14.50	13.72	12.57	11.28	9.00	7.05

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	6.67	10.22	9.12	8.35	7.43	6.43	4.94	3.73
3+00	9.11	13.71	12.28	11.26	9.99	8.66	6.61	4.98
3+00	11.47	16.97	15.21	14.00	12.41	10.79	8.25	6.23
3+00	14.67	20.89	18.82	17.32	15.39	13.30	10.15	7.68
3+50	6.68	9.13	8.32	7.69	6.96	6.15	4.80	3.61
3+50	9.16	12.49	11.39	10.56	9.53	8.40	6.51	4.87
3+50	11.50	15.40	14.14	13.10	11.78	10.39	8.04	6.03
3+50	14.81	19.14	17.60	16.29	14.68	12.92	9.96	7.43
4+00	6.62	10.52	9.61	8.86	7.98	6.97	5.26	3.91
4+00	9.10	14.48	13.24	12.20	10.93	9.55	7.14	5.26
4+00	11.41	17.87	16.38	15.20	13.50	11.81	8.87	6.46
4+00	14.67	22.38	20.60	19.07	16.91	14.77	11.04	8.05
4+50	6.63	8.83	8.70	8.04	7.25	6.40	4.93	3.71
4+50	9.12	11.92	11.80	10.94	9.87	8.67	6.72	5.05
4+50	11.49	14.63	14.44	13.45	11.99	10.61	8.16	6.15
4+50	14.70	18.24	18.05	16.80	14.95	13.25	10.19	7.70
5+00	6.70	8.51	8.36	8.14	7.65	6.68	5.04	3.80
5+00	9.16	11.43	11.28	11.04	10.31	9.03	6.83	5.12
5+00	11.55	14.11	13.88	13.60	12.69	11.13	8.43	6.36
5+00	14.75	17.43	17.13	16.91	15.66	13.82	10.52	7.88

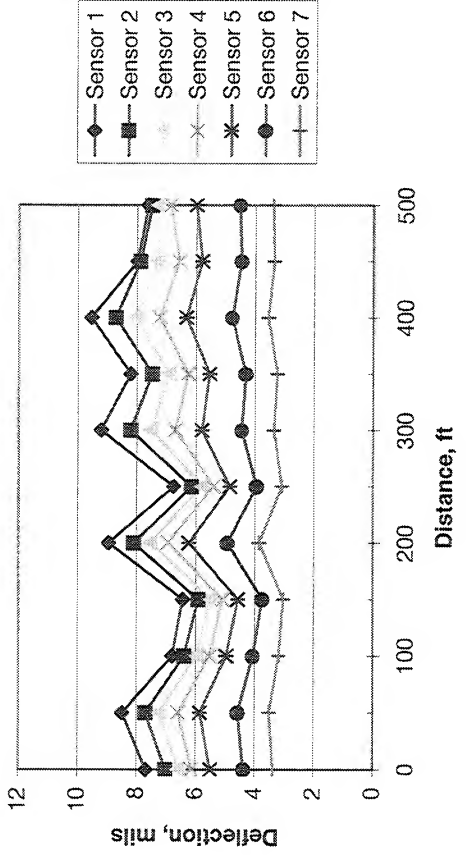
Hammond, Sensor 1 Deflections



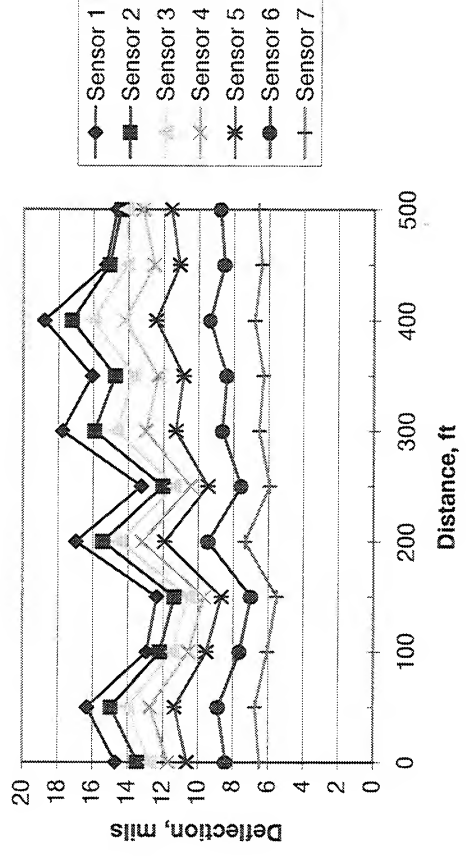
Hammond, Sensor 7 Deflections



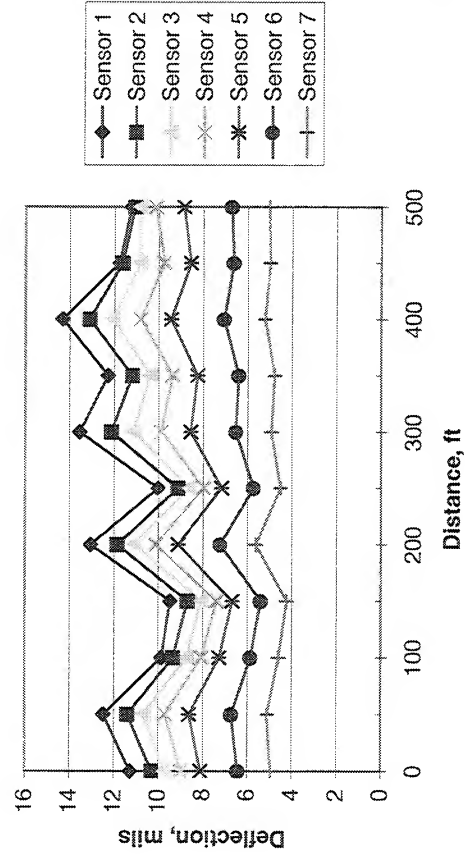
Hammond, 6,000-lb Load



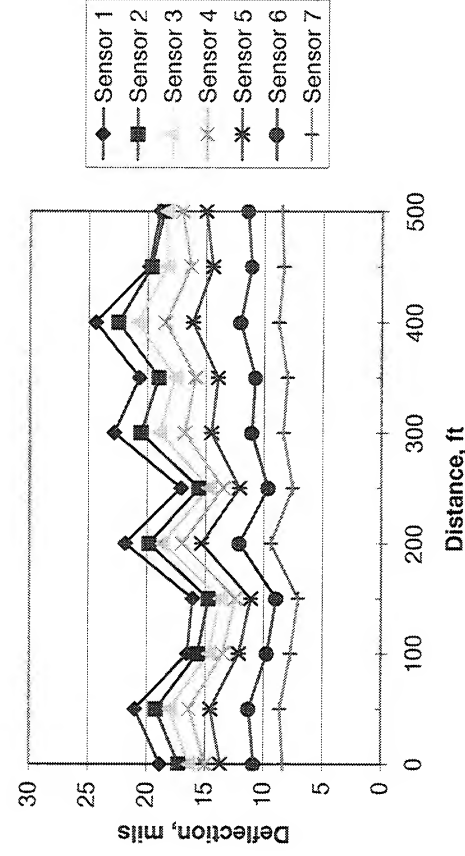
Hammond, 12,000-lb Load



Hammond, 9,000-lb Load



Hammond, 16,000-lb Load



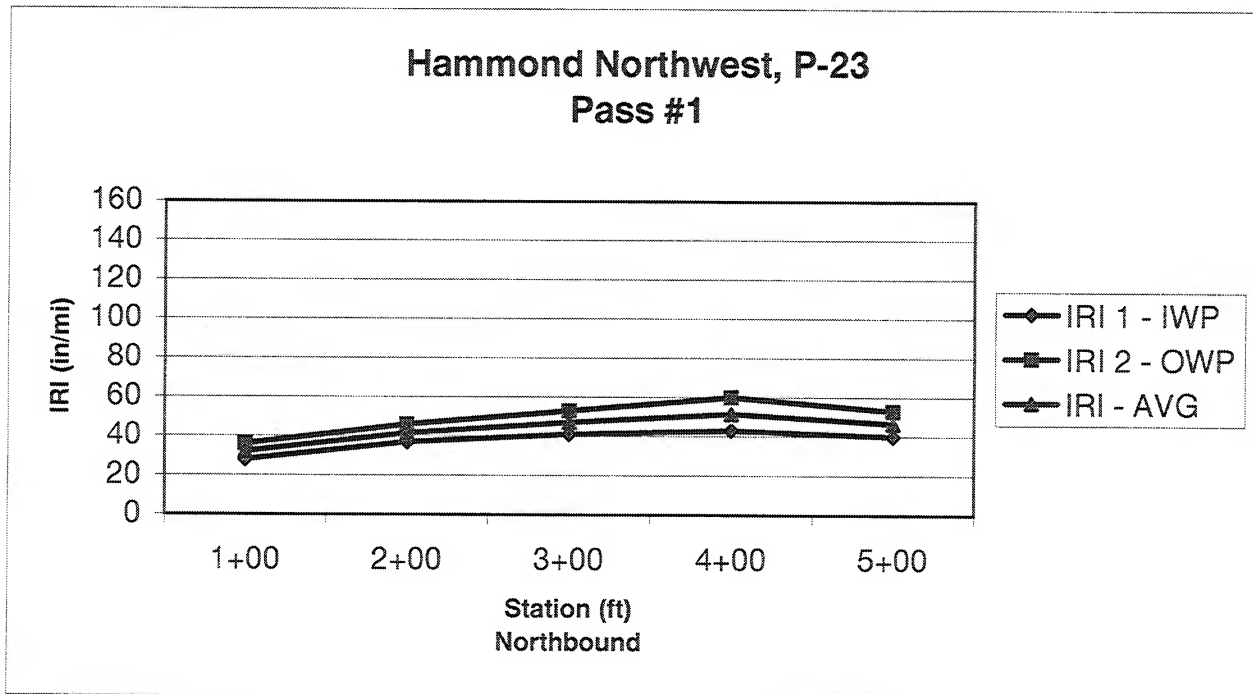
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Hammond
 Longitude: 105°09' W
 Latitude: 45°19' N

Profile Data

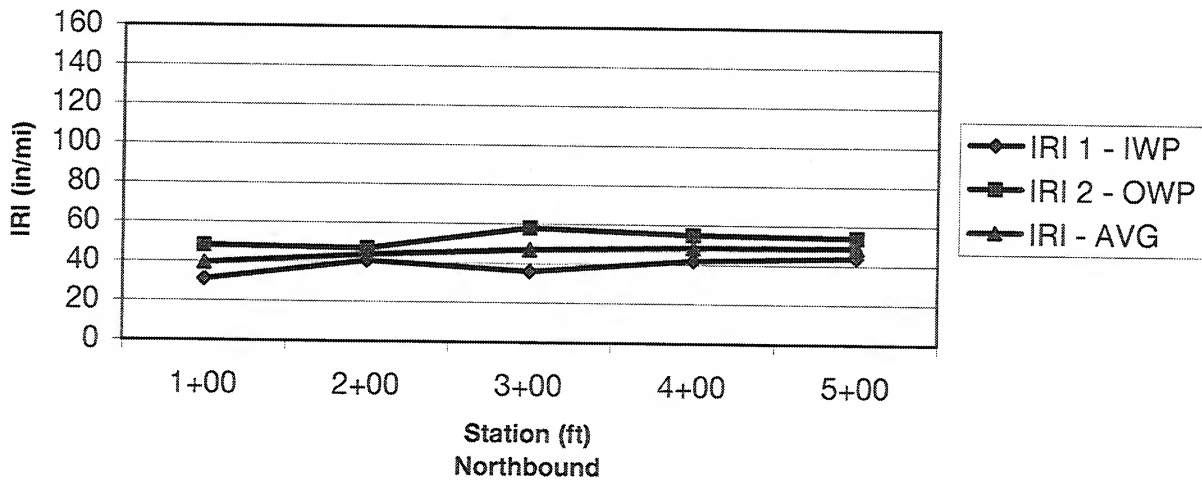
Test Date: 9/28/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.08	0.034	28	36	32
2+00	100	200	100	0.13	0.020	37	46	42
3+00	200	300	100	0.09	0.033	41	53	47
4+00	300	400	100	0.04	0.017	43	60	52
5+00	400	500	100	0.10	0.020	40	53	47
AVG.				0.088	0.025	37.8	49.6	43.7
STD.				0.033	0.008	5.891	9.072	7.438

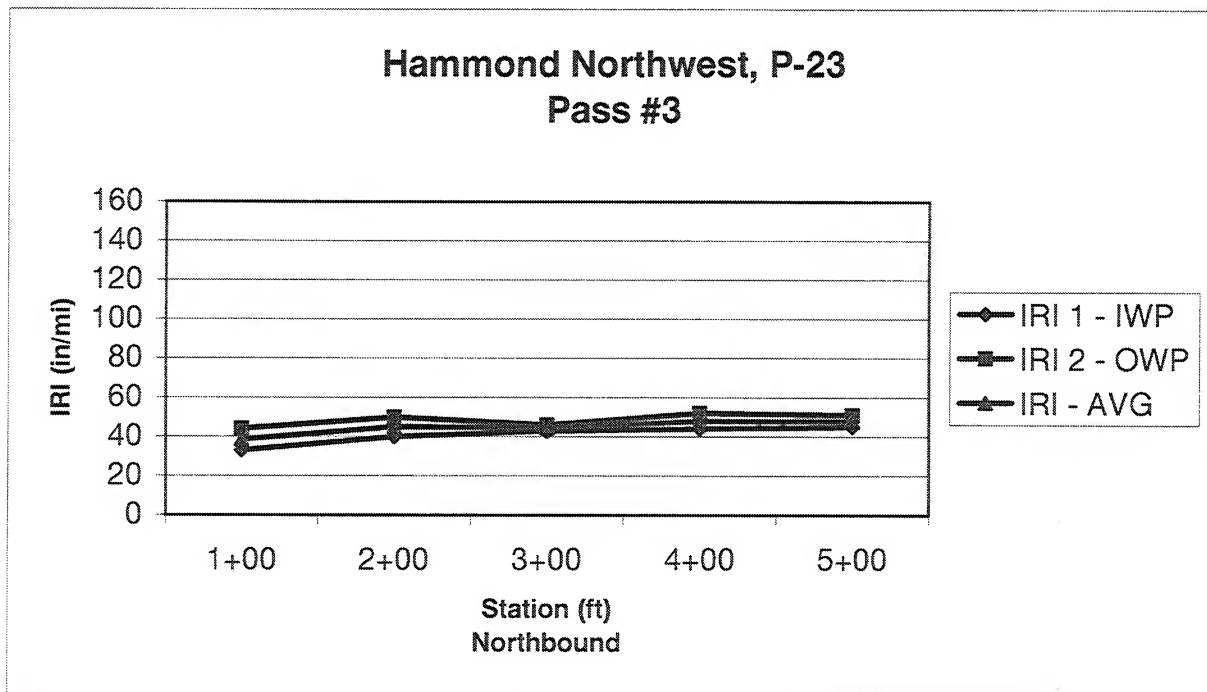


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.13	0.021	31	48	40
2+00	100	200	100	0.14	0.017	41	47	44
3+00	200	300	100	0.11	0.024	36	58	47
4+00	300	400	100	0.09	0.018	42	55	49
5+00	400	500	100	0.11	0.021	44	54	49
AVG.				0.116	0.020	38.8	52.4	45.6
STD.				0.019	0.003	5.263	4.722	3.927

Hammond Northwest, P-23 Pass #2

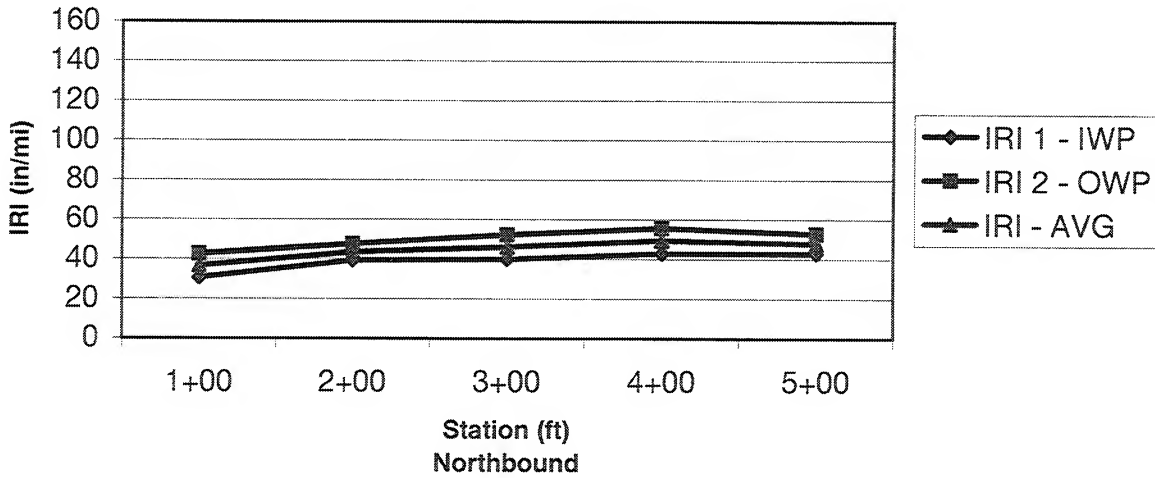


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.13	0.025	33	44	39
2+00	100	200	100	0.11	0.018	40	50	45
3+00	200	300	100	0.07	0.018	43	46	45
4+00	300	400	100	0.08	0.018	44	52	48
5+00	400	500	100	0.07	0.027	45	51	48
AVG.				0.092	0.021	41.0	48.6	44.8
STD.				0.027	0.004	4.848	3.435	3.883



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.11	0.027	31	43	37
2+00	100	200	100	0.13	0.018	39	48	44
3+00	200	300	100	0.09	0.025	40	52	46
4+00	300	400	100	0.07	0.018	43	56	49
5+00	400	500	100	0.09	0.023	43	53	48
AVG.				0.099	0.022	39.2	50.2	44.7
STD.				0.022	0.004	5.059	5.091	4.985

**Hammond Northwest, P-23
average - all passes**



APPENDIX F

WOLF POINT

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Wolf Point
 Longitude: 105°31' W
 Latitude: 47°57' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	3.7	3.7	3.7	Chip Seal
2	CTB	19.8	19.8	19.8	
3	Subgrade	-	-	-	Dark Brwn-Blk Stiff Highly Plastic Clay w/ Scatt. Grvl.

Materials Sampling

Date: 4/24/02

Material Type	Quantity	Comments
ACP/CTB	14 cores	2-10" & 12-6" cores
CTB	2 bags	ACP/CTB cores
Subgrade	4 shelby, 3bags	1 TBD, 1 split spoon

SHRP REGION _____ STATE CODE _____
 STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING
 LTPP EXPERIMENT Walp Pt 5 ROUTE/HIGHWAY P-25 Lane _____ Direction NB
 SAMPLE/TEST: (a) Before Section V #1 (b) After Section _____ FIELD SET NO. _____
LOG OF SHOULDER PROBE DCG SHEET: 08
 OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER _____ OF _____
 AUGERING DATE 4-29-02 LOCATION STATION: RP 37.4 (S.E.W.) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	3.5"	PMS	
2	23.5"	CTB	Sample 3.5" to 23.5"
3		dk brn - blk stiff highly plast. cly w/ scattered gravel	Shelby Tube 23.5" - 47.5" (11" Recov.)
4			
5		Subgrade	Shelby Tube 47.5" - 78.5" (11" Recov.)
6			
7			
8			
9			
10			
11			
12			
13			
14		brn-dk brn stiff highly plastic cly some gravel	
15			
16			
17			
18			
19			
20	Dry to T.D.		

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ - 19____
 Date

SHRP REGION _____ STATE CODE _____
 STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING
 LTPP EXPERIMENT Walt Pt 5 ROUTE/HIGHWAY P-25 Lane _____ SHRP ASSIGNED ID _____
 SAMPLE/TEST: (a) Before Section _____ (b) After Section ✓ #2 Direction N/B FIELD SET NO. _____
 LOG OF SHOULDER PROBE DCG SHEET: 08
 OPERATOR Dan M EQUIPMENT USED _____ SHEET NUMBER _____ OF _____
 AUGERING DATE 2-24-02 LOCATION STATION: RP 37.4 (N. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	3 6/8"	PMS	
2	8.5" (Recover)	CTB	Sample 12.25"
3	23.5"	dk brn stiff gravelly clay	< 20.5"
4		Sub grade dk brn - blk stiff highly plastic clay some gravel	Split spoon
5			23.5" - 41.5"
6			{ 2 blows 18"
7			(11.5 Recover)
8		blk. plast. clay	Shelby Tube
9			42.5" - 66.5"
10		brn & fine sand - silt	(15.15" Recover)
11		dk brn clayey gravel	Shelby Tube
12			66.5" - 90.5"
13		dk brn highly plast clay	(15" Recover)
14			loose mat'l on tip
15			
16			
17		ord brn clayey gravel	
18			
19			
20	Dry to TD		

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ - 19____
 Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Wolf Point

Longitude: 105°31' W

Latitude: 47°57' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR)

4/24/02

SURVEYOR 1: WT

SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3	EDGE CRACKING (METERS)	0.0	0.0	0.0
4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
5	REFLECTION CRACKING AT JOINTS	Not Recorded		
6	TRANSVERSE CRACKING			
	Number of Cracks	13	0	0
	Length (Meters)	45.2	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0
8	Potholes (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Wolf Point
 Longitude: 105°31' W
 Latitude: 47°57' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/15/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10 SHOving
 (Number)
 (Square Meters)

SURFACE DEFECTS

11 BLEEDING
 (Square Meters)

12 POLISHED AGGREGATE
 (Square Meters)

13 RAVELING
 (Square Meters)

MISCELLANEOUS DISTRESSES

14 LANE-TO-SHOULDER DROPOFF - Not Recorded

15 WATER BLEEDING AND PUMPING
 (Number)
 Length of Affected Pavement
 (Meters)

16 OTHER (Describe) _____

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

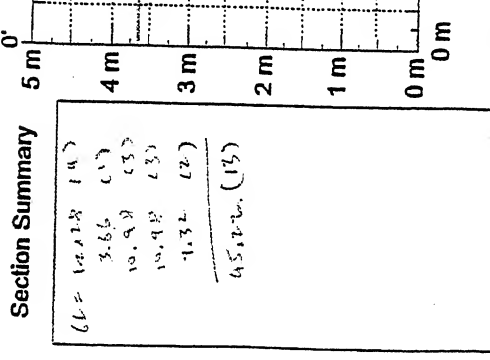
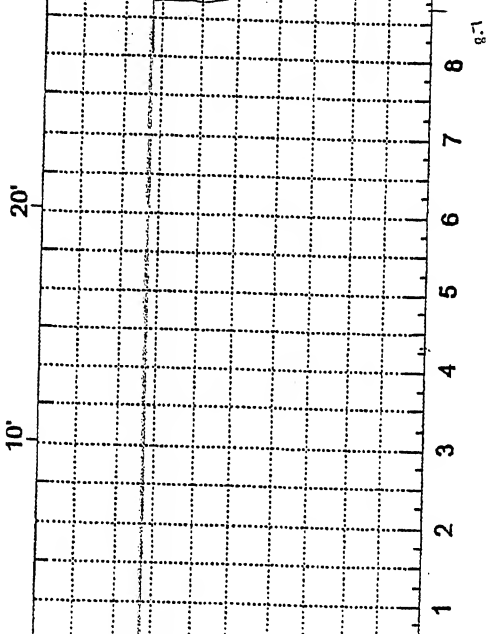
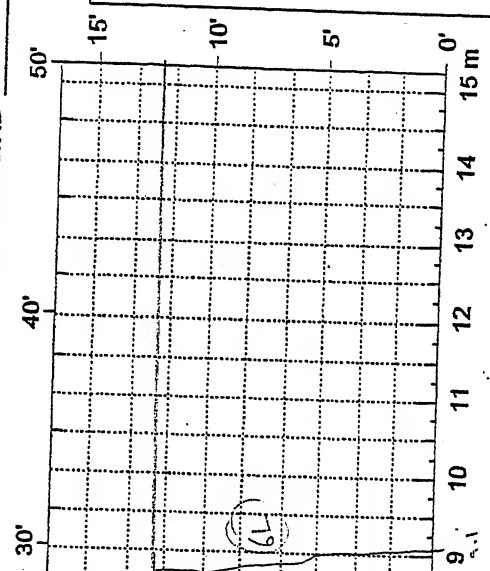
Pavement Temp:
 Before _____ After _____

Surveyors: WT BS
 Date: 4/24/82

Reviewer: _____
 Date: _____

Section Summary
 6L = 14.128 (14)
 3.65 (1)
 10.98 (5)
 10.92 (3)
 1.32 (2)

 45.22 (15)



Sheet Summary

6L = 5.66 + 2.14 + 6.4 + 1.5 + 3.66
 = 12.22 (4)

Comments: _____

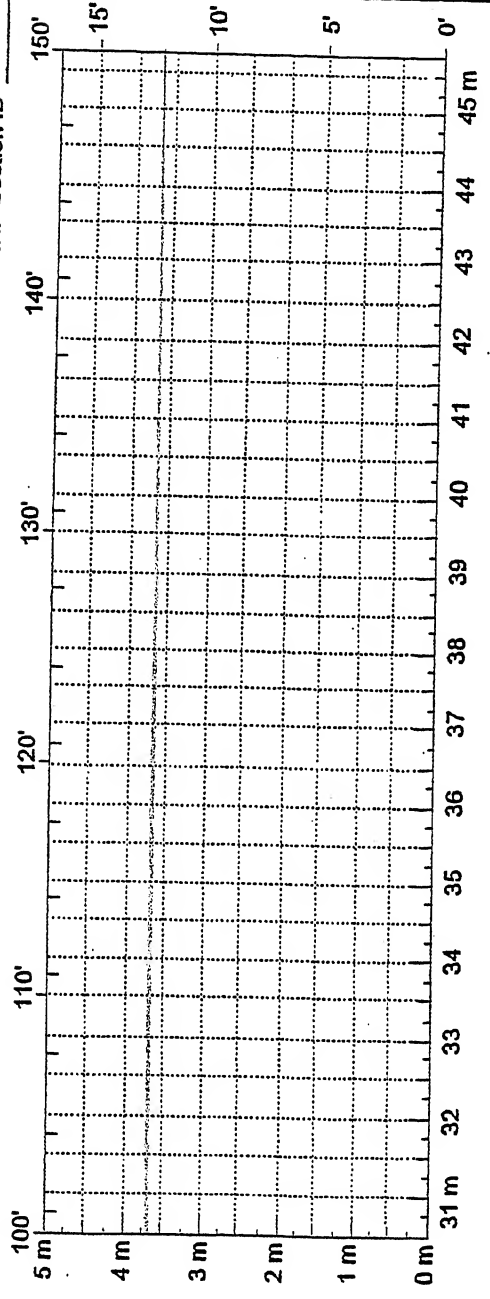
Comments: _____

Comments: _____

Reviewer: _____
Date: _____

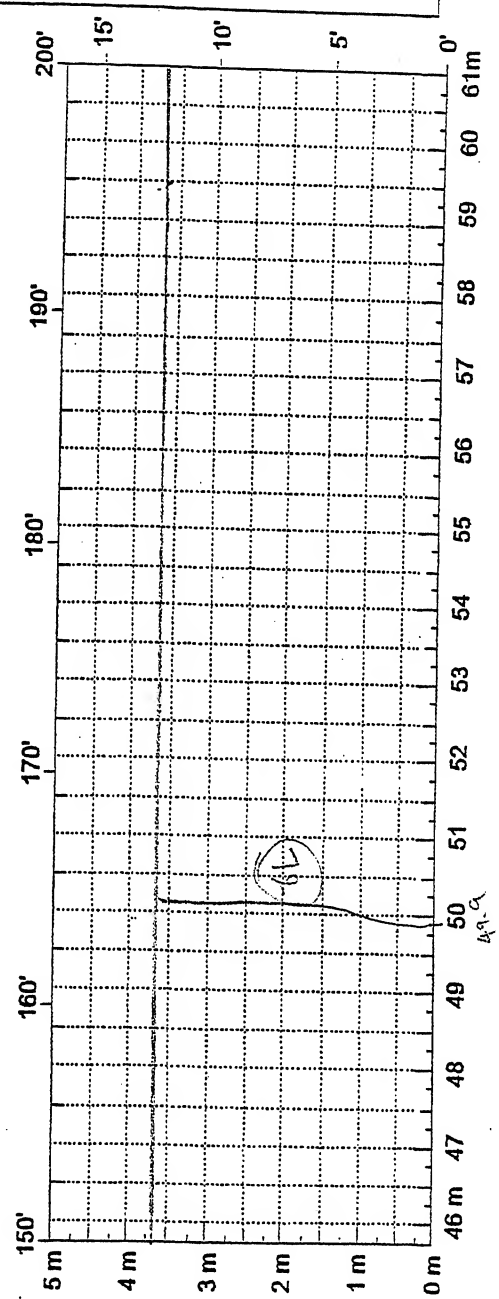
State Assigned ID _____
State Code _____
SHRP Section ID _____

Surveyors: AT (55)
Date: 4/24/02



Sheet Summary
6L = 3.55 (55)

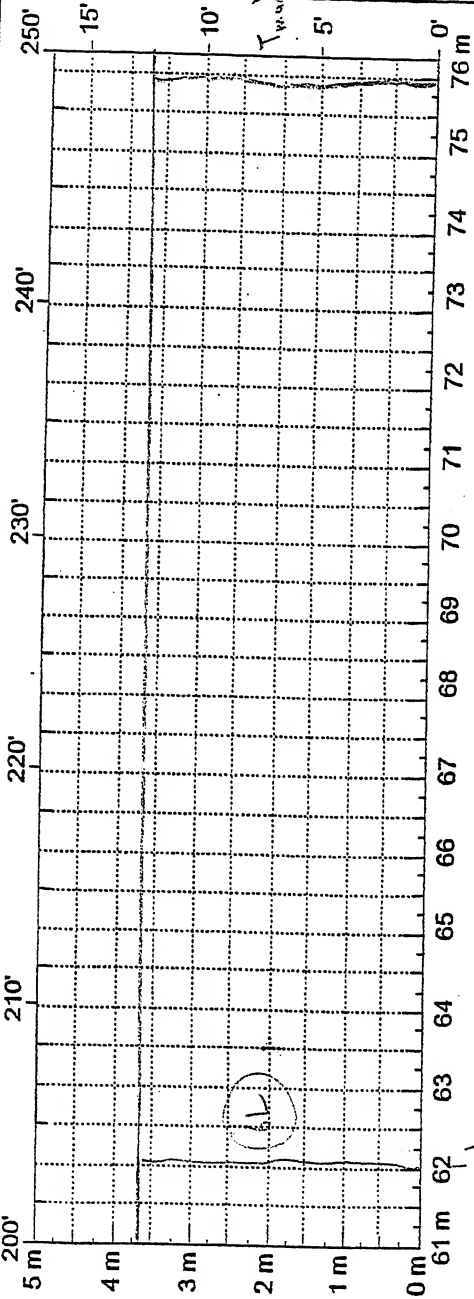
Comments: _____



Comments: _____

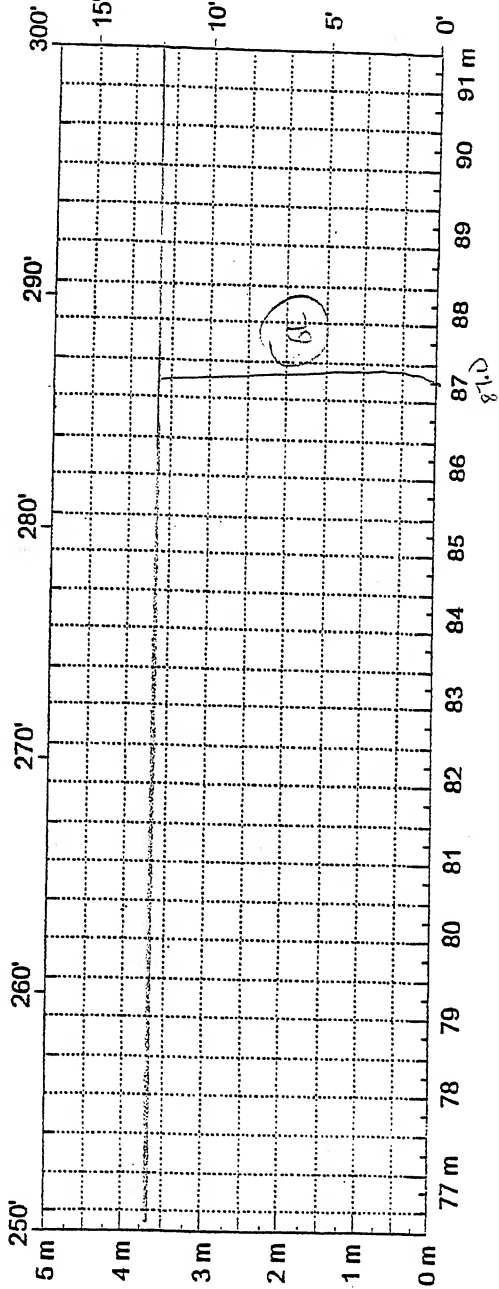
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Surveyors: JT BS
 Date: 4/20/02



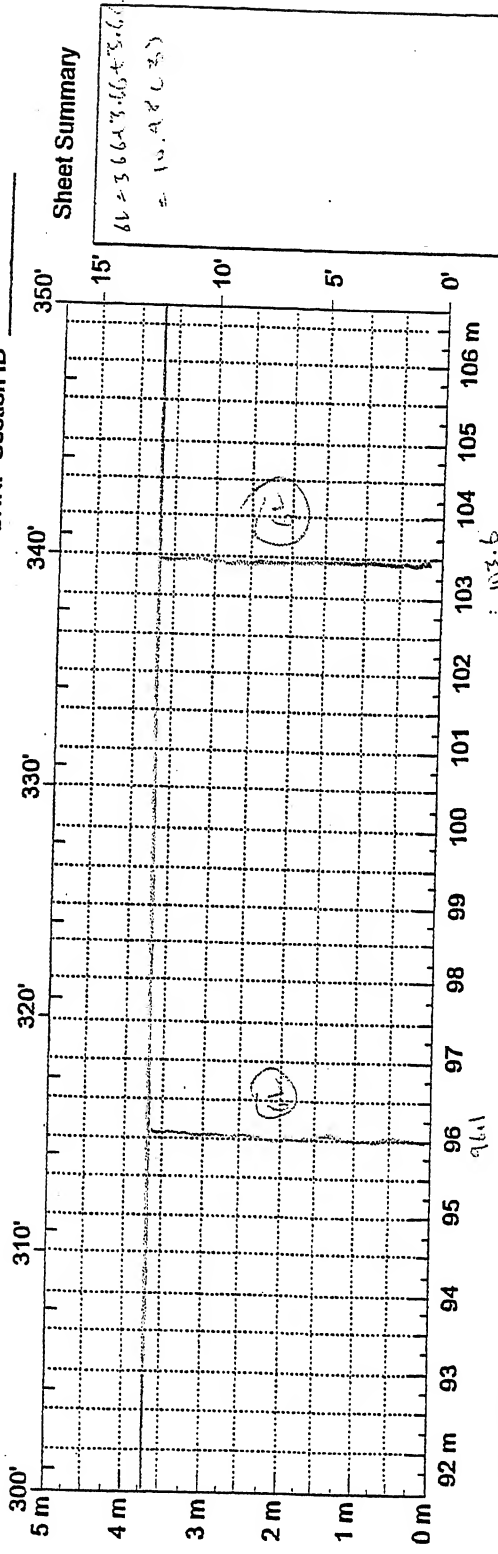
Comments: 2x8 (0.1)

Sheet Summary
 (L = 3.46m 3.46m 3.46m 3.46m)
 (S = 10.98m 10.98m)



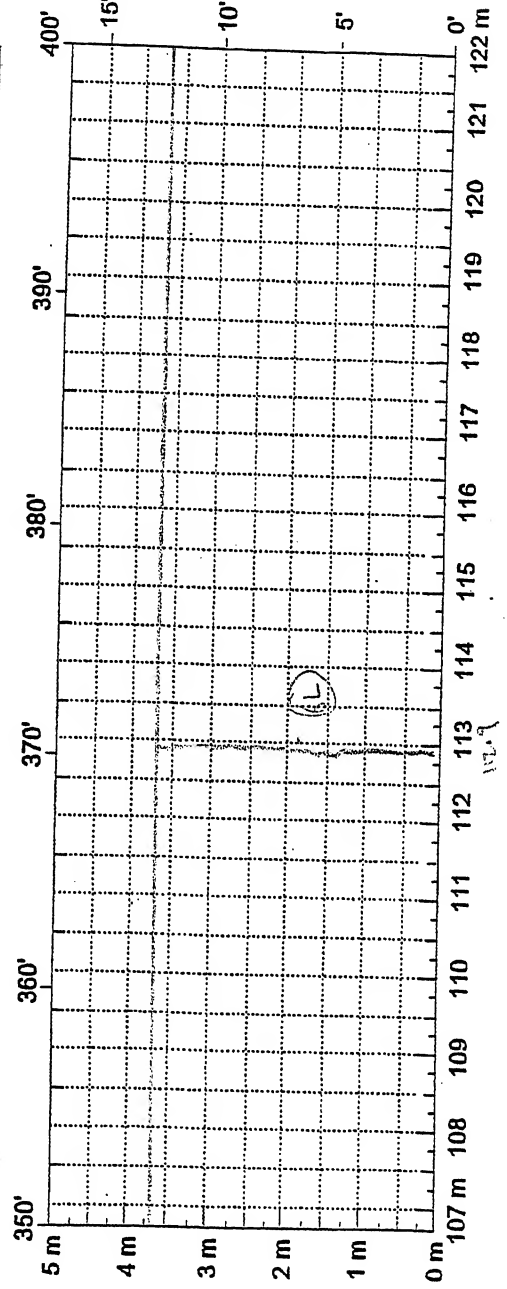
Comments:

Reviewer: _____ State Assigned ID: _____
 Date: _____ State Code: _____
 Surveyors: KT / BS
 Date: 4/24/02
 SHRP Section ID: _____



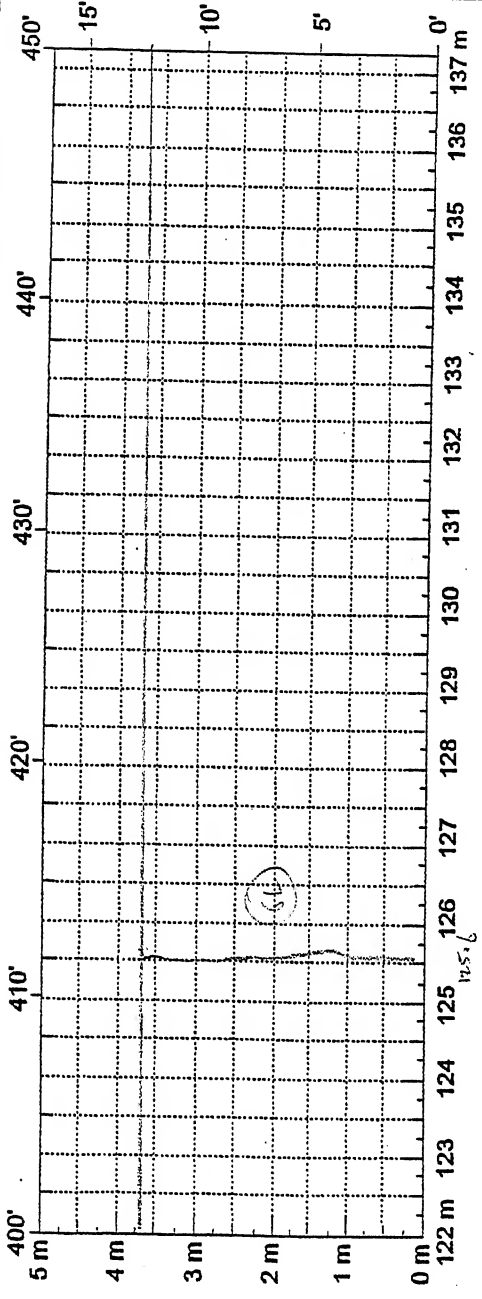
Comments: _____

Sheet Summary
 11-36647.65-3.6
 = 10.48(3)



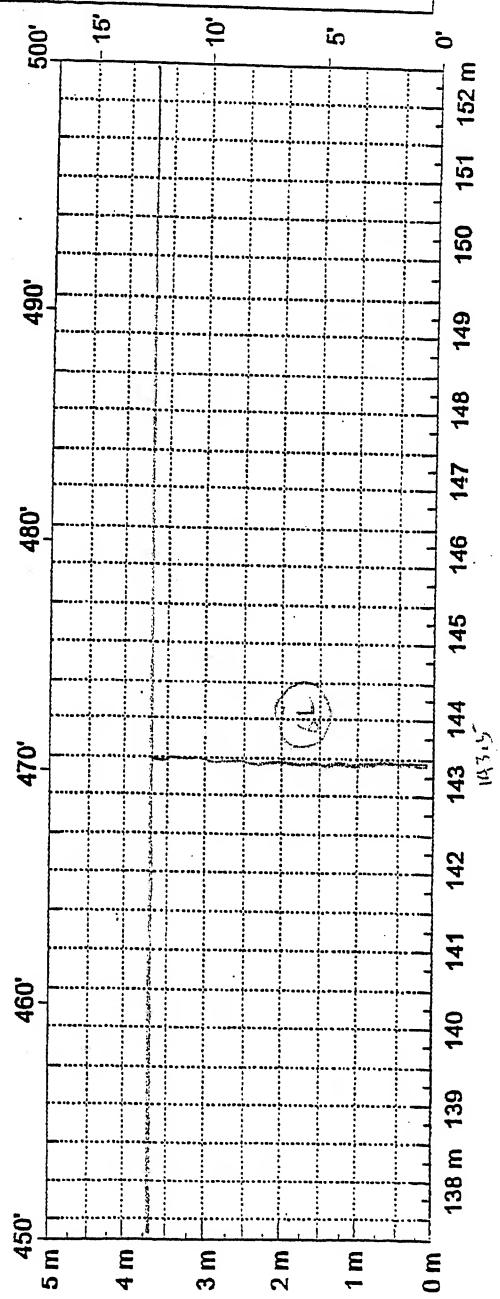
Comments: _____

Reviewer: _____ State Assigned ID _____
 Date: _____ State Code _____
 Surveyors: WT/BS Pavement Temp: _____
 Date: 4/24/82 After _____
 SHRP Section ID _____



Comments: _____

Sheet Summary
 GL = 3.16 A3.66
 = 7.32 (2.7)



Comments: _____

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Wolf Point
 Longitude: 105°31' W
 Latitude: 47°57' N

FWD Data

Test Date: 10/9/01

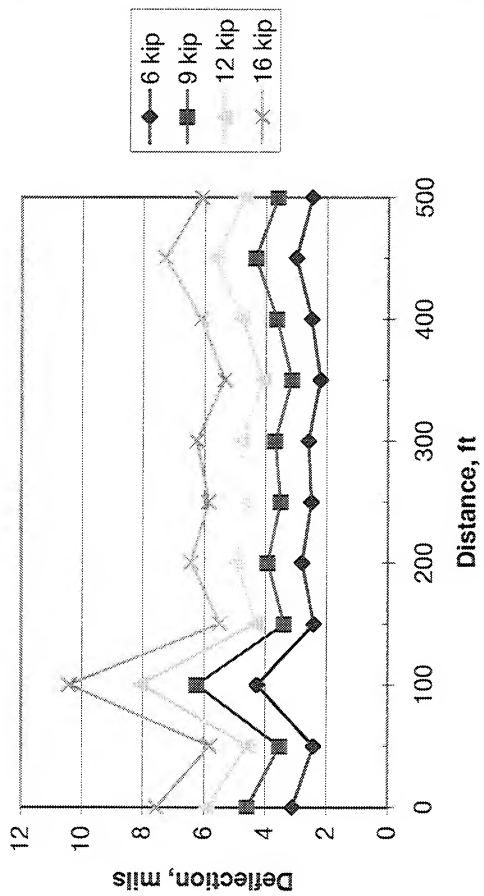
Layer	Material Type	Average Thickness in.
1	ACP	3.7
2	CTB	19.8
3	Subgrade	-

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	7.20	3.73	3.40	3.22	3.03	2.77	2.34	1.93
0+00	10.07	5.11	4.70	4.42	4.14	3.78	3.23	2.68
0+00	12.34	6.06	5.57	5.24	4.92	4.48	3.79	3.15
0+00	15.51	7.33	6.75	6.37	5.94	5.48	4.62	3.82
0+50	7.23	2.93	2.75	2.61	2.52	2.35	2.05	1.73
0+50	9.97	3.90	3.69	3.51	3.36	3.16	2.76	2.30
0+50	12.32	4.71	4.52	4.26	4.04	3.80	3.32	2.78
0+50	15.39	5.61	5.39	5.08	4.81	4.50	3.88	3.29
1+00	7.08	5.04	4.51	4.22	3.88	3.47	2.84	2.34
1+00	9.86	6.83	6.11	5.73	5.21	4.69	3.84	3.08
1+00	12.33	8.30	7.44	6.94	6.31	5.70	4.64	3.74
1+00	15.18	9.90	8.92	8.30	7.53	6.76	5.56	4.44
1+50	7.09	2.85	2.67	2.43	2.25	2.11	1.89	1.64
1+50	9.96	3.74	3.58	3.24	3.02	2.81	2.51	2.14
1+50	12.29	4.43	4.25	3.83	3.54	3.31	2.93	2.48
1+50	15.40	5.29	5.09	4.59	4.22	3.96	3.49	3.13
2+00	7.09	3.31	3.17	3.06	2.96	2.69	2.38	2.17
2+00	9.91	4.32	4.12	3.97	3.84	3.50	3.05	2.58
2+00	12.29	5.06	4.79	4.63	4.48	4.08	3.53	3.02
2+00	15.42	6.21	5.93	5.78	5.50	5.01	4.31	3.73
2+50	7.28	3.04	2.85	2.73	2.65	2.46	2.20	1.99
2+50	9.72	3.79	3.50	3.37	3.19	3.04	2.75	2.44
2+50	12.00	4.63	4.30	4.12	3.94	3.76	3.42	3.02
2+50	15.47	5.67	5.34	5.17	4.89	4.62	4.19	3.76

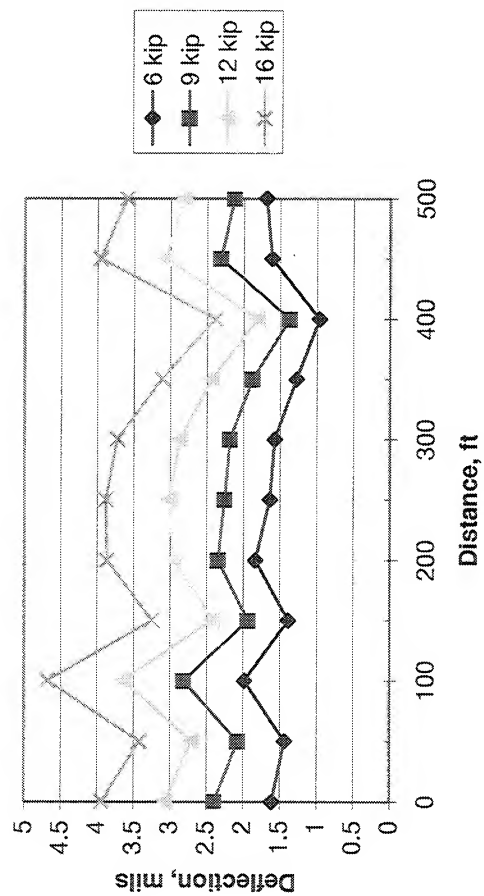
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	7.24	3.13	2.97	2.83	2.69	2.53	2.25	1.90
3+00	9.64	3.95	3.74	3.59	3.41	3.18	2.76	2.34
3+00	12.04	4.82	4.56	4.37	4.15	3.87	3.38	2.88
3+00	15.44	6.04	5.75	5.52	5.18	4.85	4.21	3.60
3+50	7.18	2.64	2.47	2.36	2.25	2.09	1.81	1.53
3+50	9.61	3.35	3.14	3.03	2.85	2.67	2.29	2.00
3+50	11.94	4.05	3.82	3.69	3.49	3.24	2.79	2.42
3+50	15.41	5.14	4.81	4.67	4.38	4.09	3.59	3.00
4+00	7.09	2.96	2.89	2.81	2.82	2.78	1.33	1.14
4+00	9.59	3.87	3.78	3.73	3.70	3.66	1.71	1.46
4+00	11.88	4.72	4.63	4.55	4.50	4.47	2.11	1.79
4+00	15.41	5.88	5.82	5.65	5.62	5.61	2.67	2.30
4+50	7.11	3.56	3.28	3.13	2.94	2.71	2.33	1.91
4+50	9.58	4.60	4.24	4.03	3.78	3.50	2.98	2.46
4+50	12.01	5.65	5.22	4.95	4.66	4.32	3.69	3.07
4+50	15.34	6.99	6.40	6.14	5.74	5.34	4.56	3.80
5+00	7.11	2.94	2.77	2.60	2.53	2.45	2.22	2.00
5+00	9.61	3.84	3.64	3.41	3.25	3.06	2.71	2.27
5+00	11.99	4.68	4.41	4.15	4.03	3.75	3.26	2.81
5+00	15.37	5.86	5.51	5.18	4.85	4.61	4.09	3.46

non-decreasing deflection

Wolf Point, Sensor 1 Deflections

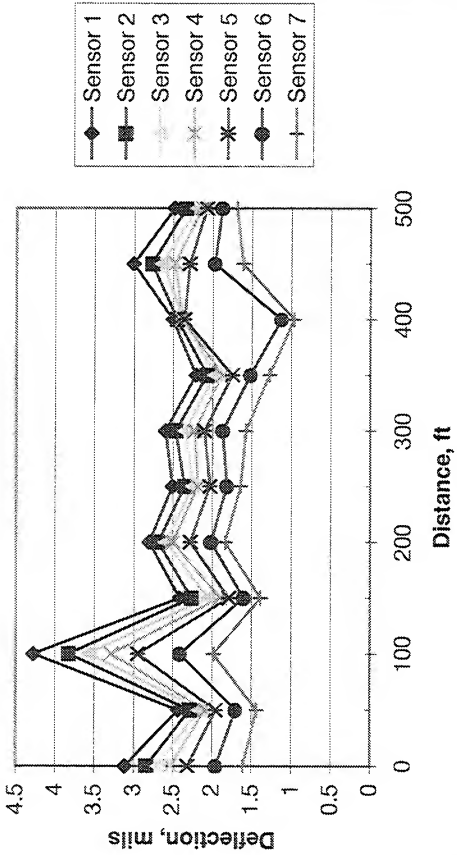


Wolf Point, Sensor 7 Deflections

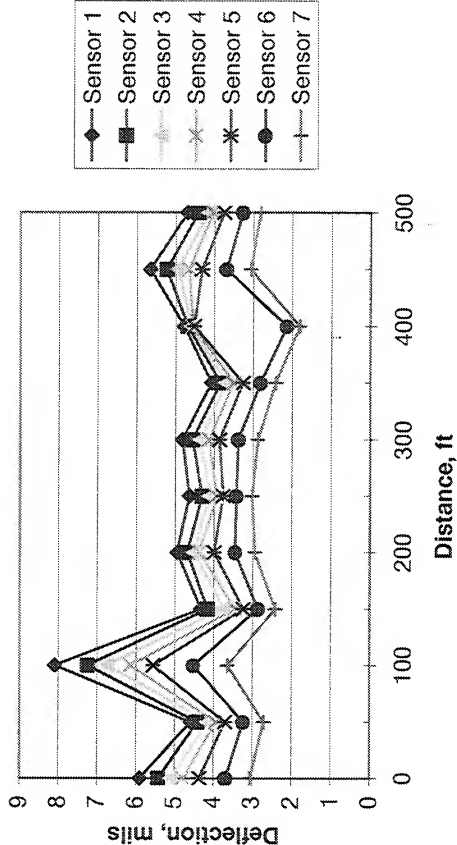


FWD Deflections

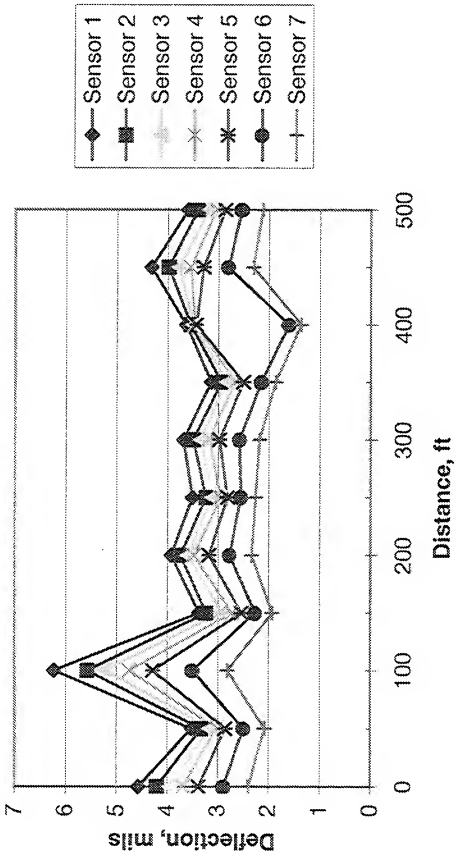
Wolf Point, 6,000-lb Load



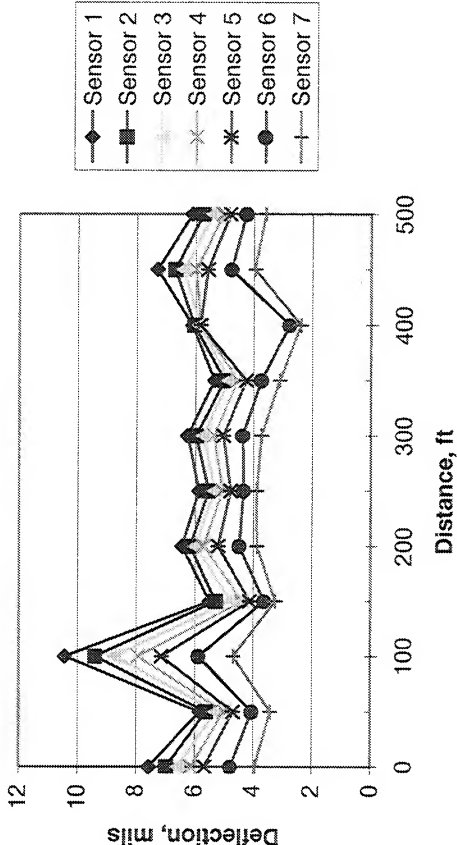
Wolf Point, 12,000-lb Load



Wolf Point, 9,000-lb Load



Wolf Point, 16,000-lb Load



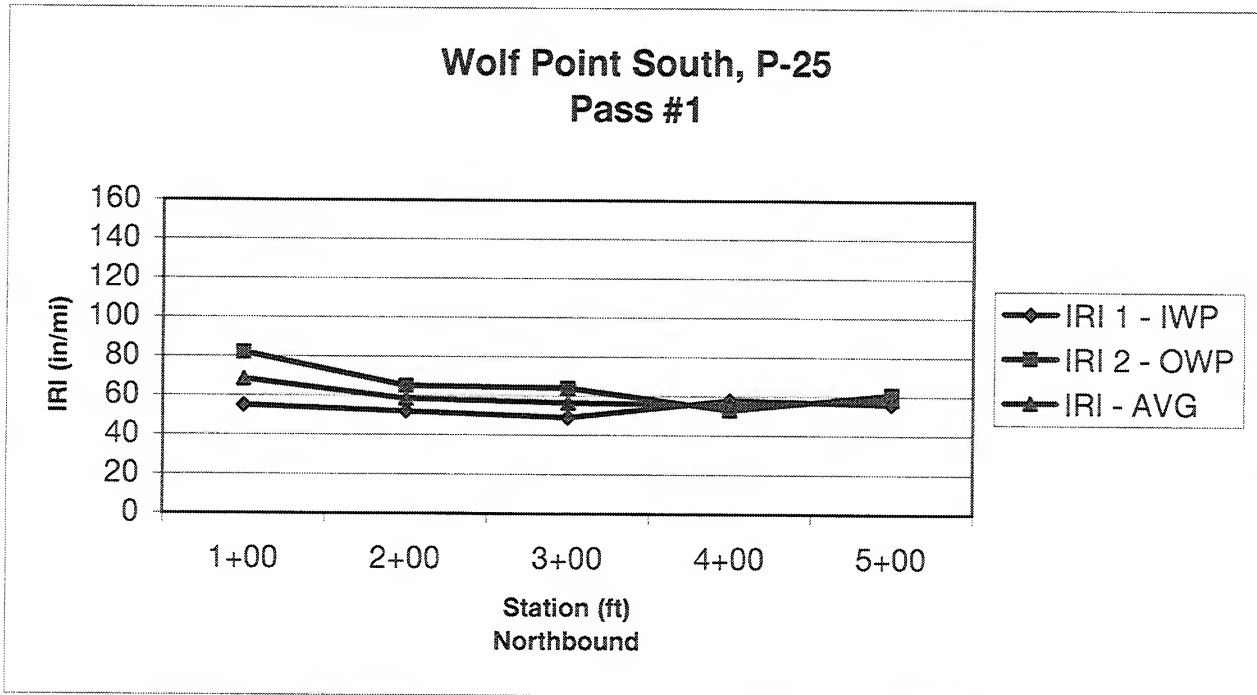
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Wolf Point
 Longitude: 105°31' W
 Latitude: 47°57' N

Profile Data

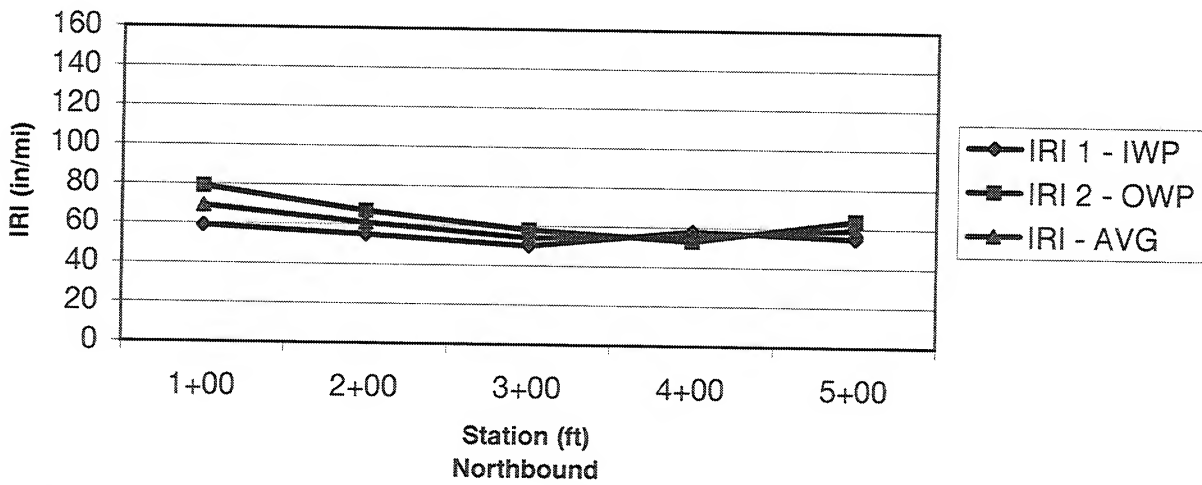
Test Date: 9/26/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.00	0.001	55	82	69
2+00	100	200	100	0.02	0.015	52	65	59
3+00	200	300	100	0.02	0.013	49	64	57
4+00	300	400	100	0.00	0.000	58	53	56
5+00	400	500	100	0.01	0.008	56	61	59
AVG.				0.010	0.007	54.0	65.0	59.5
STD.				0.010	0.007	3.536	10.607	5.196



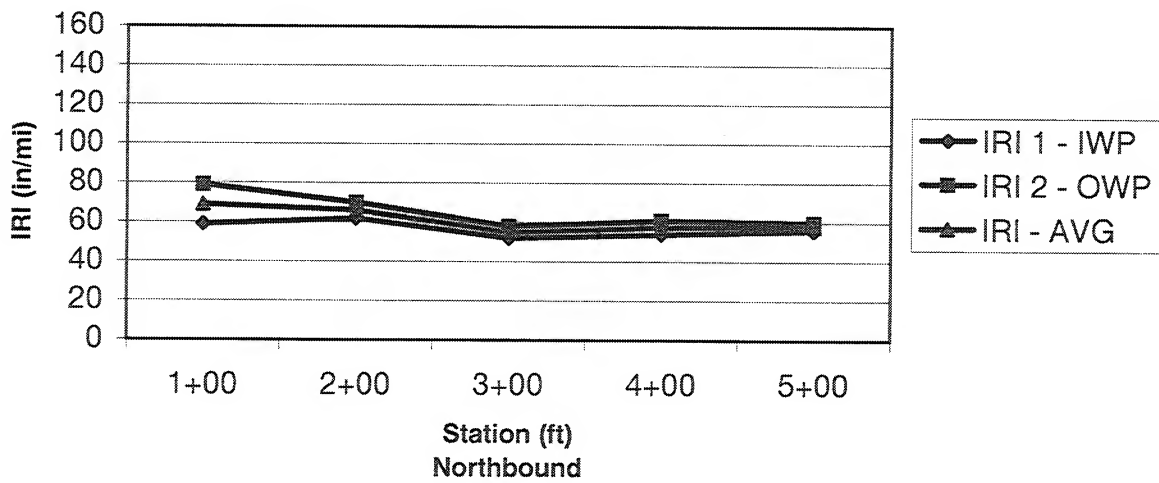
Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.00	0.000	59	79	69
2+00	100	200	100	0.01	0.009	55	67	61
3+00	200	300	100	0.02	0.015	50	58	54
4+00	300	400	100	0.00	0.000	58	53	56
5+00	400	500	100	0.01	0.013	55	64	60
AVG.				0.008	0.007	55.4	64.2	59.8
STD.				0.008	0.007	3.507	9.884	5.880

**Wolf Point South, P-25
Pass #2**



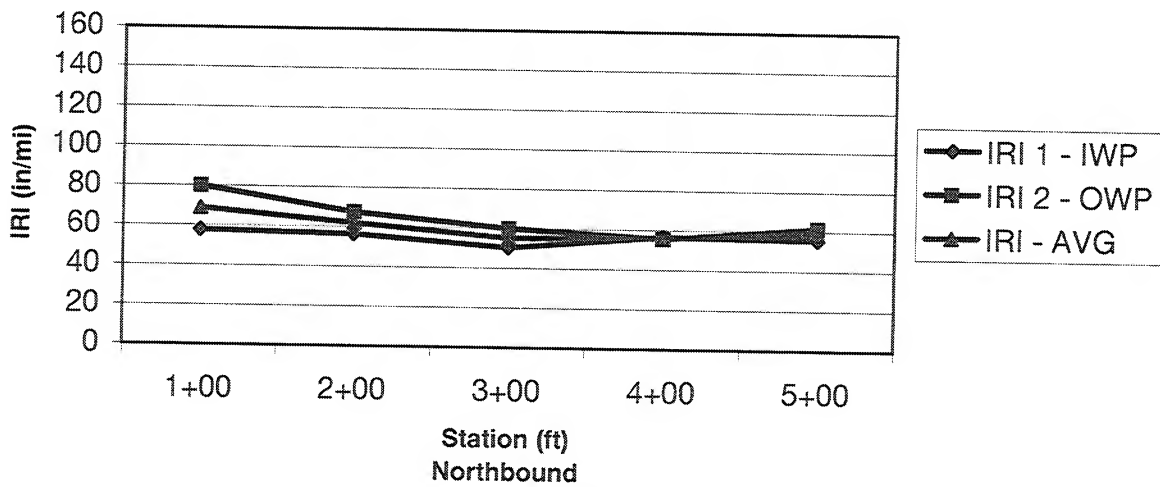
Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.00	0.000	59	79	69
2+00	100	200	100	0.00	0.000	62	70	66
3+00	200	300	100	0.00	0.000	52	58	55
4+00	300	400	100	0.00	0.000	54	61	58
5+00	400	500	100	0.01	0.011	56	60	58
AVG.				0.002	0.002	56.6	65.6	61.1
STD.				0.004	0.005	3.975	8.792	6.046

**Wolf Point South, P-25
Pass #3**



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.00	0.000	58	80	69
2+00	100	200	100	0.01	0.008	56	67	62
3+00	200	300	100	0.01	0.009	50	60	55
4+00	300	400	100	0.00	0.000	57	56	56
5+00	400	500	100	0.01	0.011	56	62	59
AVG.				0.007	0.006	55.3	64.9	60.1
STD.				0.006	0.005	2.887	9.403	5.503

**Wolf Point South, P-25
average - all passes**



APPENDIX G
FORT BELKNAP

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Fort Belknap
 Longitude: 108°30' W
 Latitude: 48°25' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	5.1	3.9	4.5	Chip Seal
2	CTB	8.0	7.0	7.5	
3	Base	41.0	37.0	39.0	Sandy Clayey Gravel
4	Subgrade	-	-	-	Brown Fine Sand with some Gravelly Clay

Materials Sampling

Date: 4/25/02

Material Type	Quantity	Comments
ACP/CTB	14 cores	2-10" & 12-6" cores
CTB	1 bag	ACP/CTB cores
Base		
Subgrade	4 bags	1 TBD

* 4 bags of material from station 5+56 could not be clearly identified because the layers could not be distinguished

SHRP REGION _____ STATE CODE _____
 STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING
 LTPP EXPERIMENT FT Belknap ROUTE/HIGHWAY P-1 Lane _____ Direction WA
 SAMPLE/TEST: (a) Before Section ✓ #1 (b) After Section _____ FIELD SET NO. _____
 OPERATOR Dan M. LOG OF SHOULDER PROBE DCG SHEET: 08
 EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 AUGERING DATE 4-25-02 LOCATION STATION: RP 442 (E. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	5.0"	PMS	
2	13.0"	CTB	
3		OTHER BASECOURSE ??	Split Spoon 52 Blows 12" + 18" = 31"
4		sandy clayey gravel	Sample 7.0" - 13.0"
5	4.5'		
6		brn fine sand w/ thin grs cly layers	Sample 30.0" - 48.0" 54 Blows
7		incr. cly ↓	Sample 36.0" - 42"
8		Subgrade	Sample 50" - 60" X2
9			
10	10.0'		
11		brn fine sand w/ gravel	Sample 10' - 15'
12			
13			
14			
15			
16			
17			
18	18"		
19		brn gravelly clay	
20		Saturated	

REFUSAL WITHIN 20 FEET (Y/N): _____ DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - 19____
 Date

SHRP REGION _____ STATE MT SHRP-LTPP FIELD MATERIAL SAMPLING AND FIELD TESTING STATE CODE _____
 LTPP EXPERIMENT Fr Belknap ROUTE/HIGHWAY P-1 Lane _____ SHRP ASSIGNED ID _____
 SAMPLE/TEST: (a) Before Section _____ (b) After Section #2 FIELD SET NO. _____
 OPERATOR Dan M. LOG OF SHOULDER PROBE _____ DCG SHEET: 08
 AUGERING DATE 4-25-02 EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 TOP OF ROCK BASED ON: _____ LOCATION STATION: RP442 (W. End) AUGER PROBE NUMBER _____
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR. OFFSET: _____ feet from 0/s

Scale (feet)	Depth from Surface (feet)	Material Description	Material Code
1	4"	PMS	
2		CTB ??	
3		dk brn gravelly sand/sandy gravel	Drilling @ 7"
4			Sample 7" - 13"
5	4.0'		Sample 16" - 21"
6		brn fine sand w/ local silt & gravel	
7		Subgrade	Sample #2
8	7.5'		33" - 60"
9		dk brn clayey sand	
10		incr. clay	Sample
11	11'		7.5' - 15'
12		dk brn clay	
13	12.5'		
14		l (org - brn gravel zones)	
15		dk brn clayey sand	
16			
17			
18	18'		
19		brn very fine clayey sand	
20		Saturated	

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____-____-____
 Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Fort Belknap

Longitude: 108°30' W

Latitude: 48°25' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR)

4/25/02

SURVEYOR 1: WT

SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
---	-------------------------------------	-----	-----	-----

2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
---	-----------------------------------	-----	-----	-----

3	EDGE CRACKING (METERS)	0.0	0.0	0.0
---	------------------------	-----	-----	-----

4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	140.5	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0

5	REFLECTION CRACKING AT JOINTS	Not Recorded		
---	-------------------------------	--------------	--	--

6	TRANSVERSE CRACKING			
	Number of Cracks	25	0	0
	Length (Meters)	51.0	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

8	Potholes (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Fort Belknap
 Longitude: 108°30' W
 Latitude: 48°25' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/25/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9 RUTTING - REFER TO PROFILE DATA

10	SHOVING (Number)	0
	(Square Meters)	0.0

SURFACE DEFECTS

11	BLEEDING (Square Meters)	0.0
----	-----------------------------	-----

12	POLISHED AGGREGATE (Square Meters)	0.0
----	---------------------------------------	-----

13	RAVELING (Square Meters)	0.0
----	-----------------------------	-----

MISCELLANEOUS DISTRESSES

14 LANE-TO-SHOULDER DROPOFF - Not Recorded

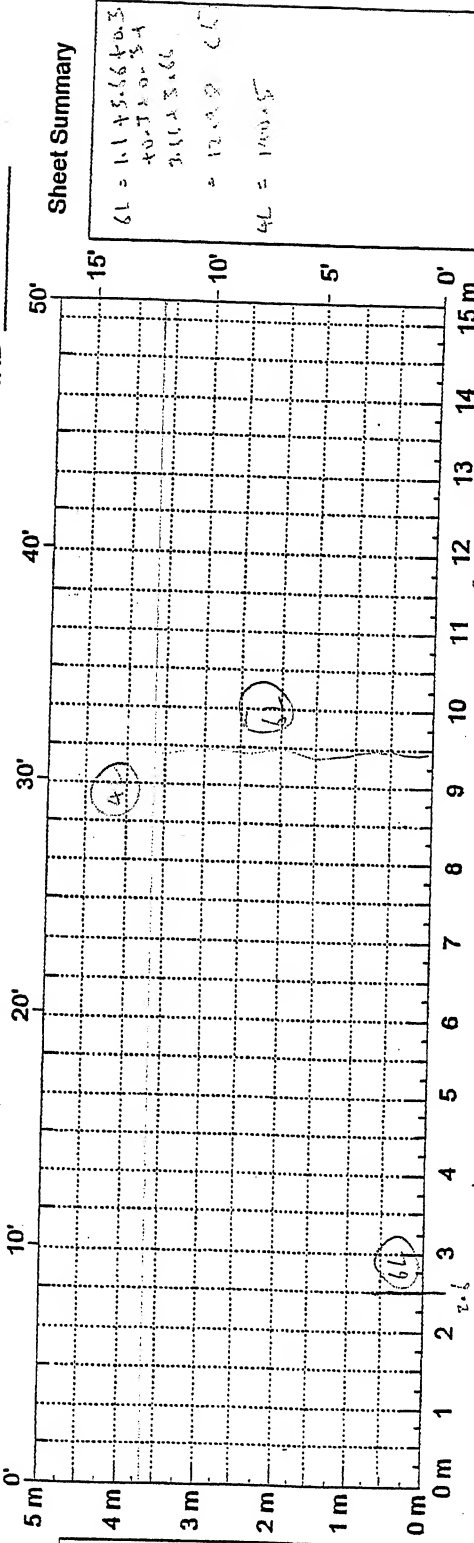
15	WATER BLEEDING AND PUMPING (Number)	0
	Length of Affected Pavement (Meters)	0.0

16 OTHER (Describe) _____

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Pavement Temp.: _____
 Before _____ After _____

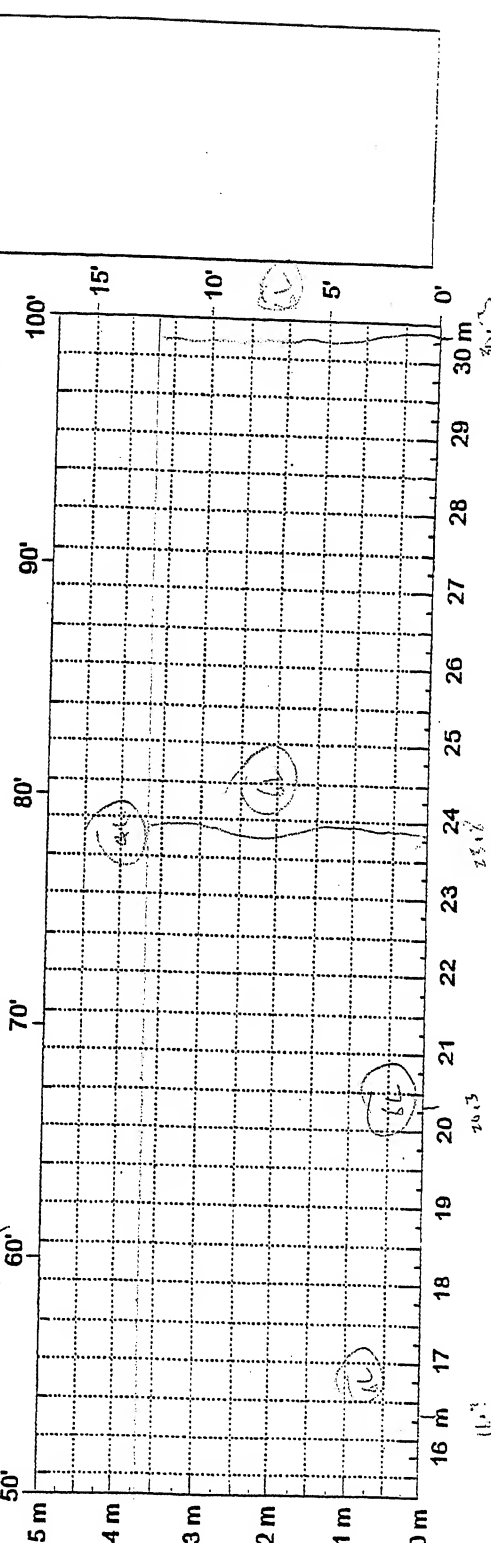
Reviewer: _____
 Date: 4/25/02
 Surveyors: WJ/SS



Section Summary

4L = 140.5
6L = 12.78 (6)
5.46 (6)
11.23 (4)
11.42 (5)
9.82 (4)
50.96 (25)

Comments: Longitudinal cracking along the exterior edge from station 0 - 142.5 m in the section except for 2m.



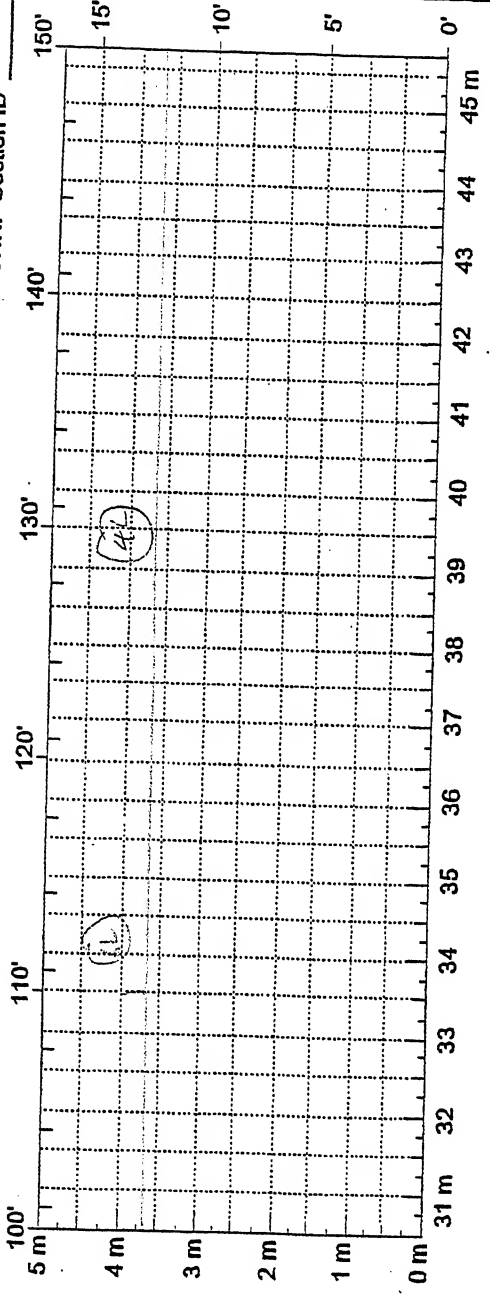
Comments: _____

Sheet Summary

6L = 1.1 + 5.66 + 0.3
40.73 + 0.34
2.11 + 3.66
= 12.09 (6)
4L = 140.5

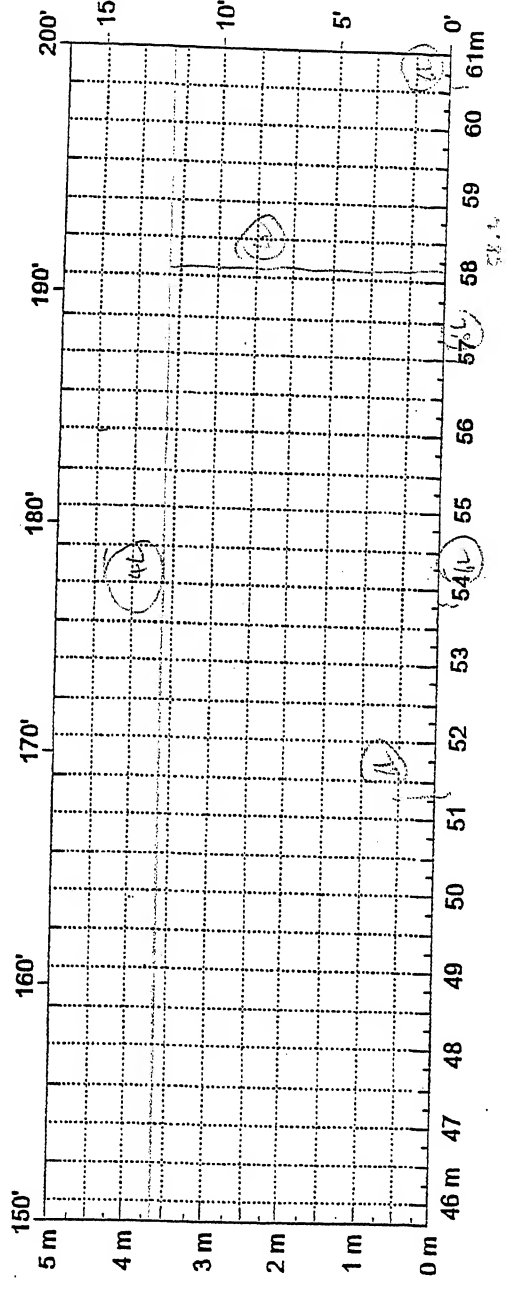
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____
 Surveyors: WJ, JS
 Date: 10/25/02



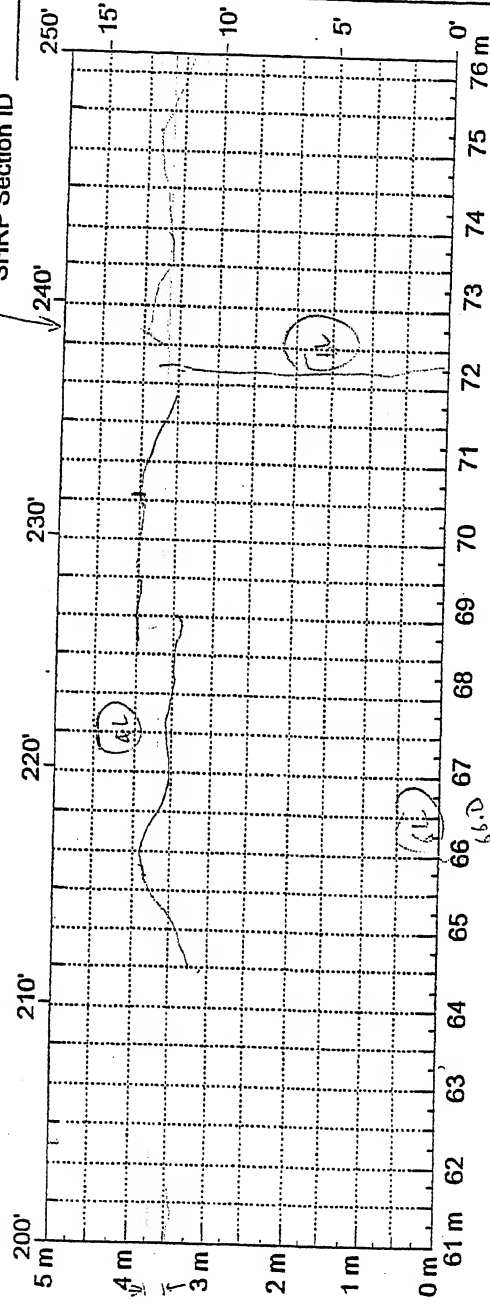
Comments: _____

Sheet Summary
 SL = 0.23 + 0.91 = 1.14
 AS = 0.64 + 0.23 = 0.87
 = 5.46 (6)

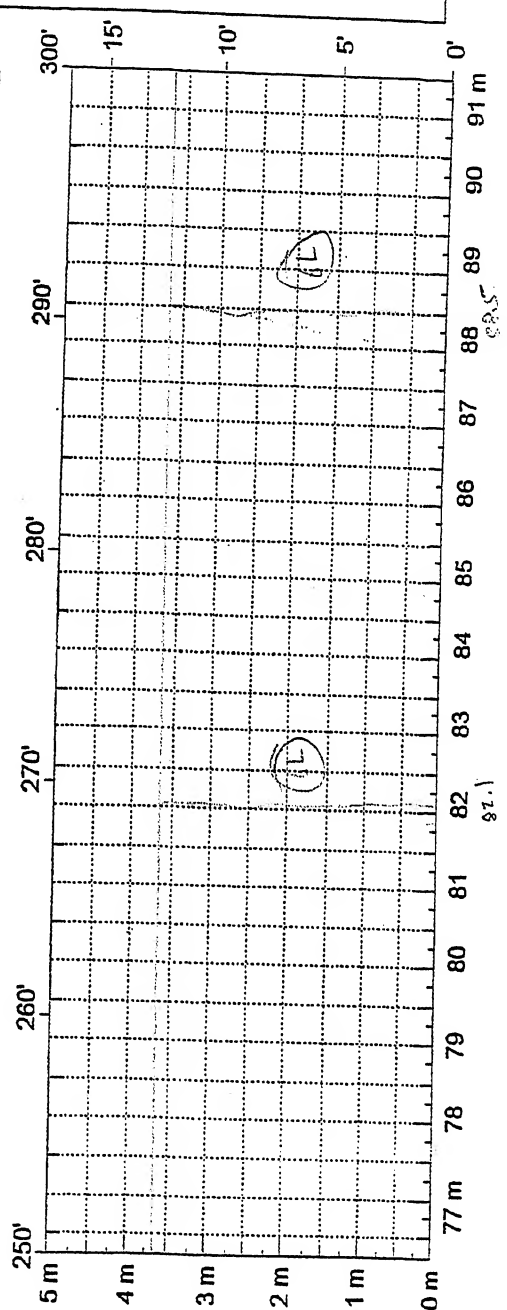


Comments: _____

Reviewer: _____ State Assigned ID _____
 Surveyors: rst/ks State Code _____
 Date: 4/26/02 SHRP Section ID _____



Comments: _____



Comments: _____

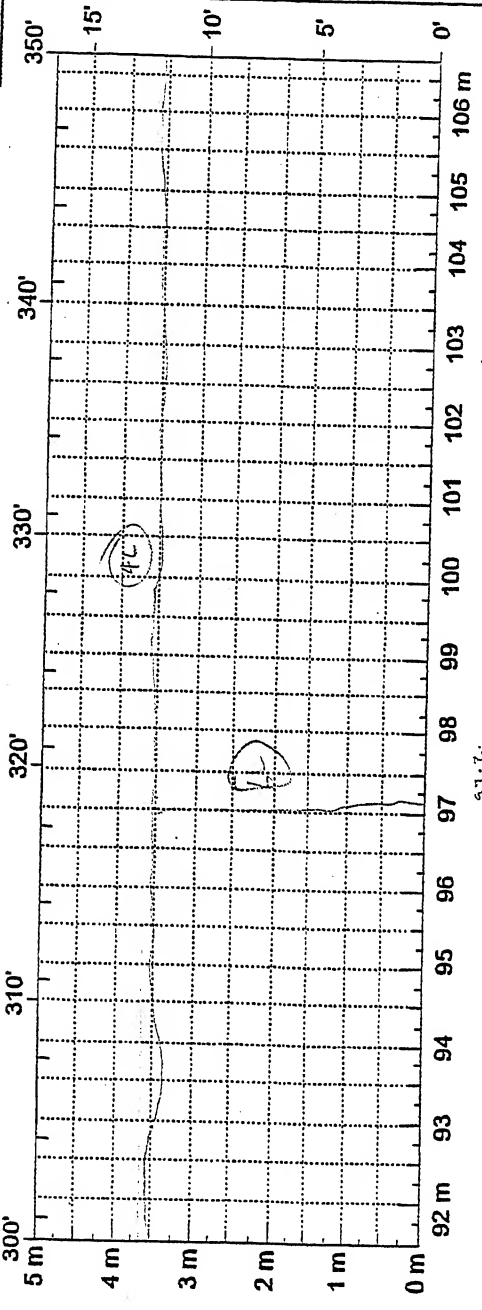
Sheet Summary

AL = 0.3 + 3.66 +
 3.66 + 3.66
 = 11.28 m (44')

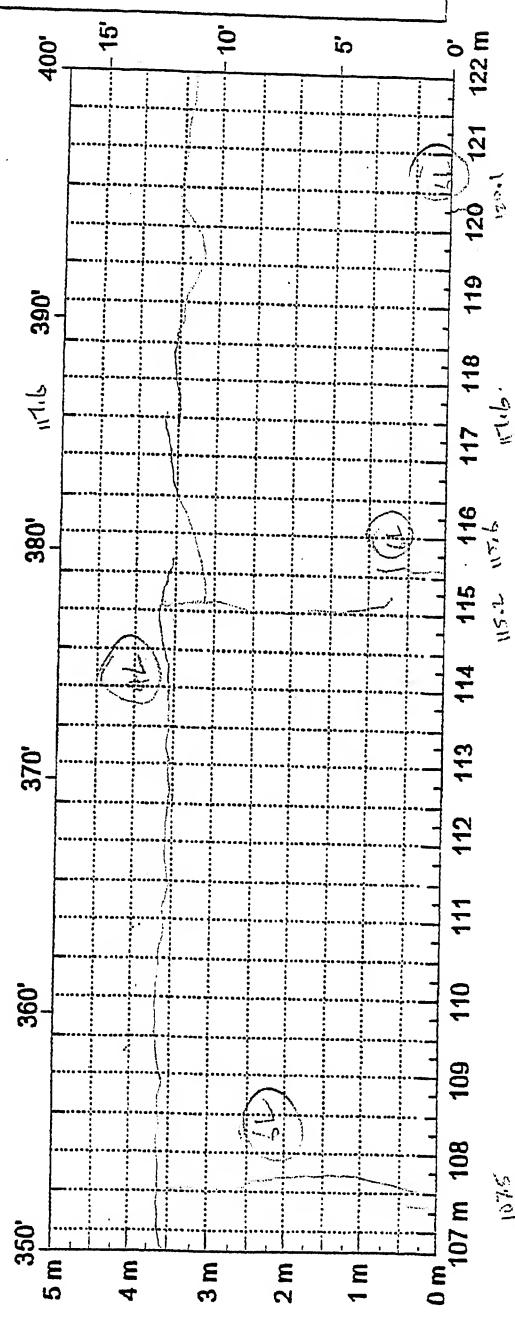
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____

Surveyors: WJ (85)
4/24/02



Comments: _____



Comments: _____

Sheet Summary

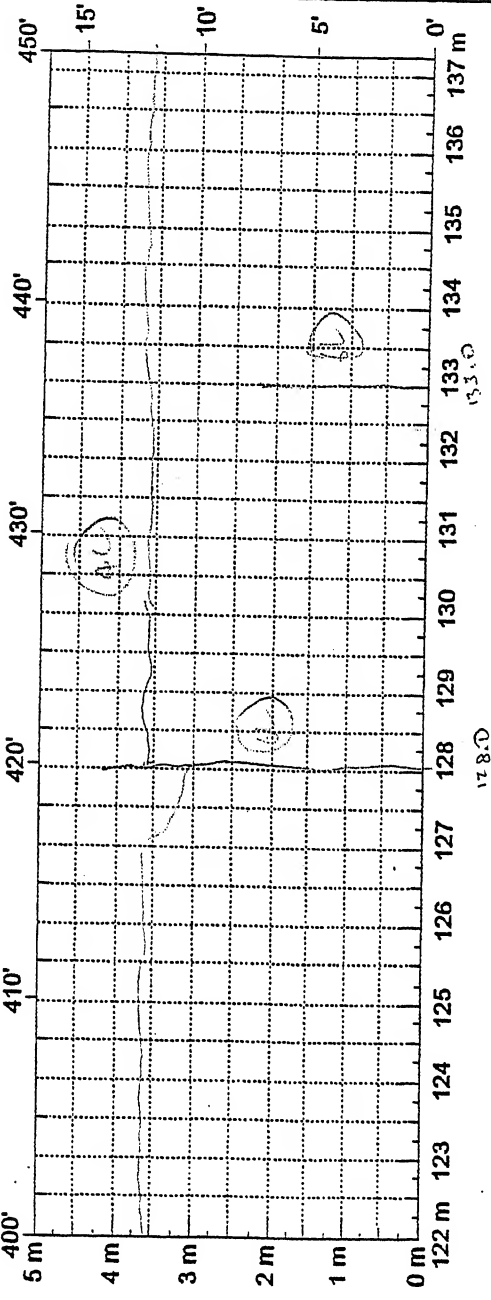
SL = 3.68 A 3.66
 3.68 A 3.66
 = 11.42 (5')

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

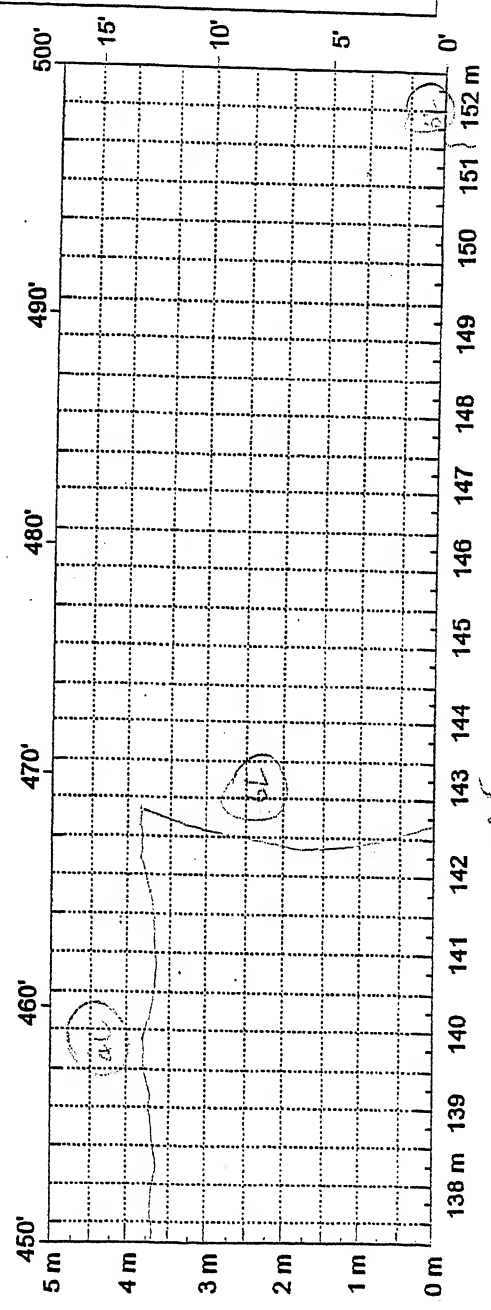
Pavement Temp: _____
 After _____

Reviewer: _____
 Date: _____

Surveyors: ST/6
 Date: 5/21/98



Comments: _____



Comments: _____

Sheet Summary

$61 = 3.66 \times 7.2 \times 5.3$
 $+ 0.5$
 $= 9.82 \quad (4.7)$

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Fort Belknap
 Longitude: 108°30' W
 Latitude: 48°25' N

FWD Data

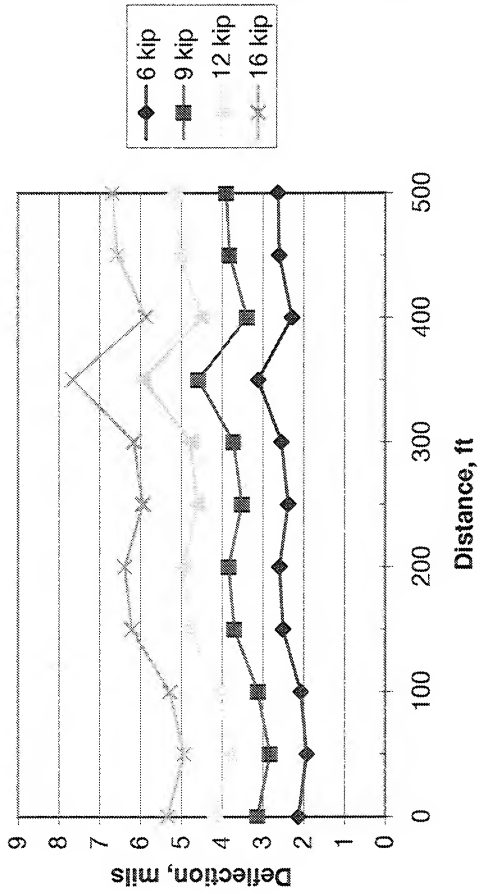
Test Date: 10/9/01

Layer	Material Type	Average Thickness in.
1	ACP	4.5
2	CTB	7.5
3	Base	39.0
4	Subgrade	-

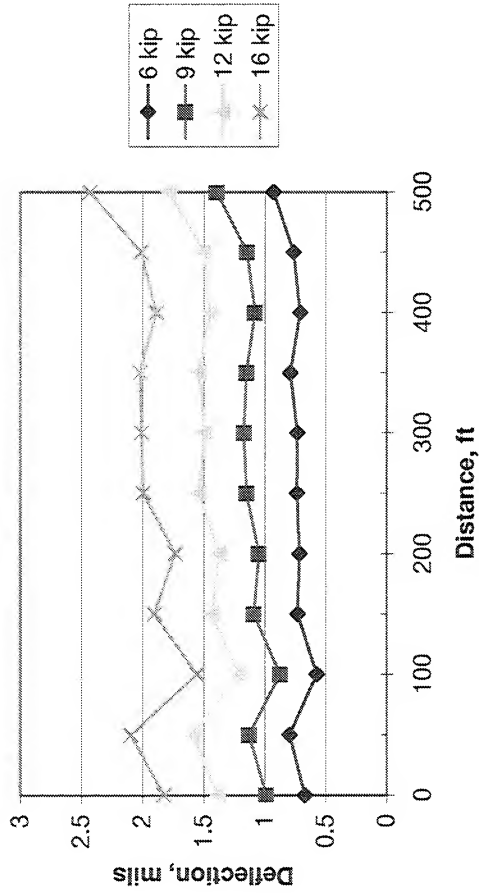
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	7.16	2.54	2.26	2.04	1.78	1.49	1.07	0.80
0+00	9.23	3.20	2.86	2.60	2.28	1.91	1.37	1.01
0+00	11.36	3.95	3.53	3.19	2.79	2.40	1.73	1.31
0+00	14.57	4.85	4.36	3.97	3.50	2.99	2.13	1.66
0+50	7.09	2.27	2.05	1.94	1.76	1.54	1.20	0.94
0+50	9.31	2.92	2.64	2.49	2.25	1.97	1.54	1.17
0+50	11.35	3.60	3.23	3.06	2.78	2.45	1.91	1.50
0+50	14.58	4.49	4.06	3.86	3.48	3.08	2.43	1.91
1+00	7.01	2.42	2.32	2.30	2.27	2.25	0.75	0.67
1+00	9.17	3.17	3.06	2.99	2.93	2.92	1.08	0.89
1+00	11.38	3.88	3.73	3.67	3.56	3.54	1.30	1.15
1+00	14.51	4.79	4.58	4.52	4.36	4.27	1.68	1.41
1+50	7.07	2.95	2.56	2.31	1.99	1.66	1.14	0.86
1+50	9.25	3.80	3.27	2.95	2.56	2.17	1.53	1.12
1+50	11.38	4.57	3.95	3.57	3.14	2.63	1.89	1.36
1+50	14.54	5.65	4.90	4.47	3.85	3.29	2.29	1.73
2+00	7.05	3.04	2.55	2.23	1.83	1.49	1.05	0.84
2+00	9.10	3.88	3.27	2.84	2.34	1.90	1.41	1.06
2+00	11.36	4.69	3.98	3.51	2.91	2.36	1.74	1.30
2+00	14.51	5.79	4.93	4.28	3.51	2.92	2.24	1.57
2+50	7.03	2.79	2.35	2.06	1.83	1.55	1.24	0.86
2+50	9.16	3.57	3.03	2.68	2.32	2.02	1.54	1.17
2+50	11.24	4.32	3.67	3.27	2.82	2.44	1.92	1.44
2+50	14.60	5.42	4.63	4.18	3.63	3.07	2.29	1.82

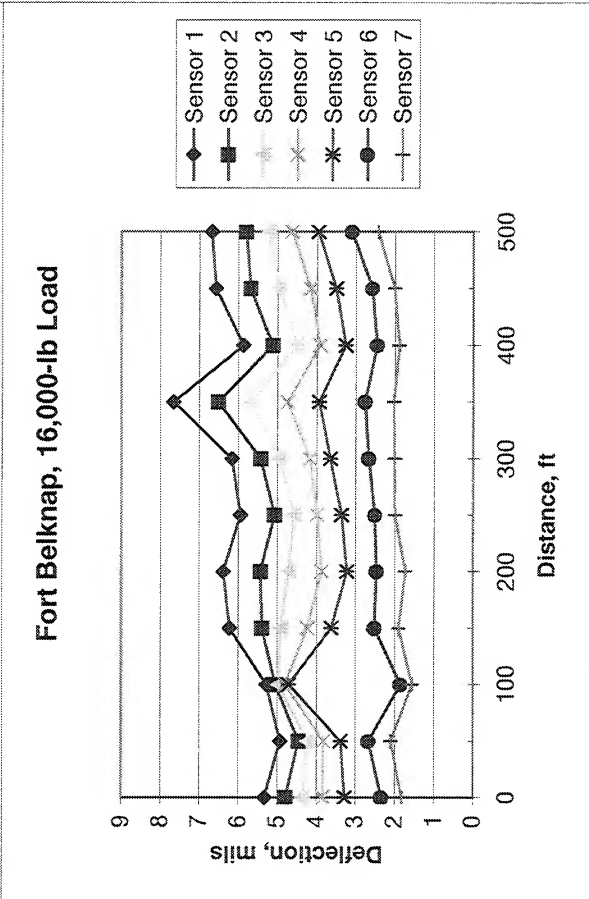
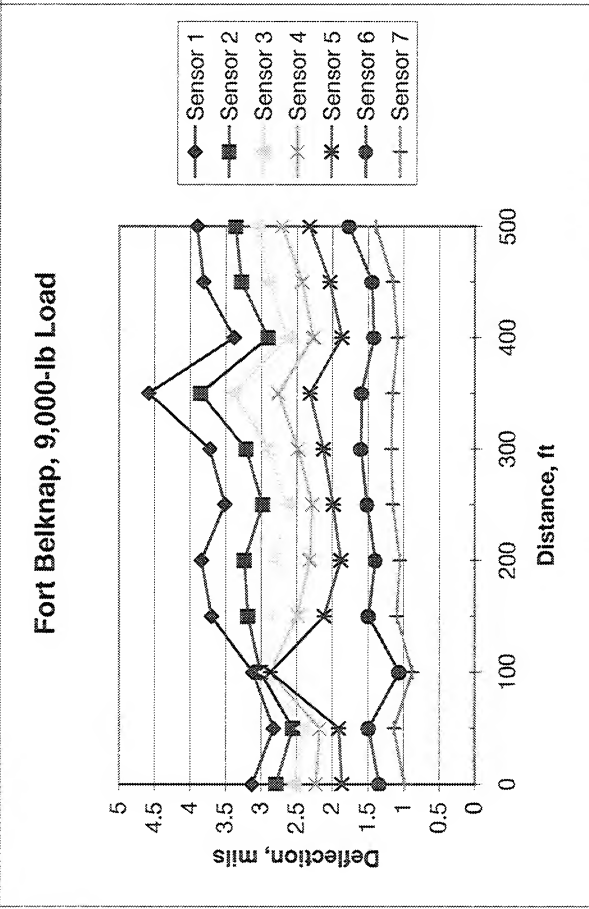
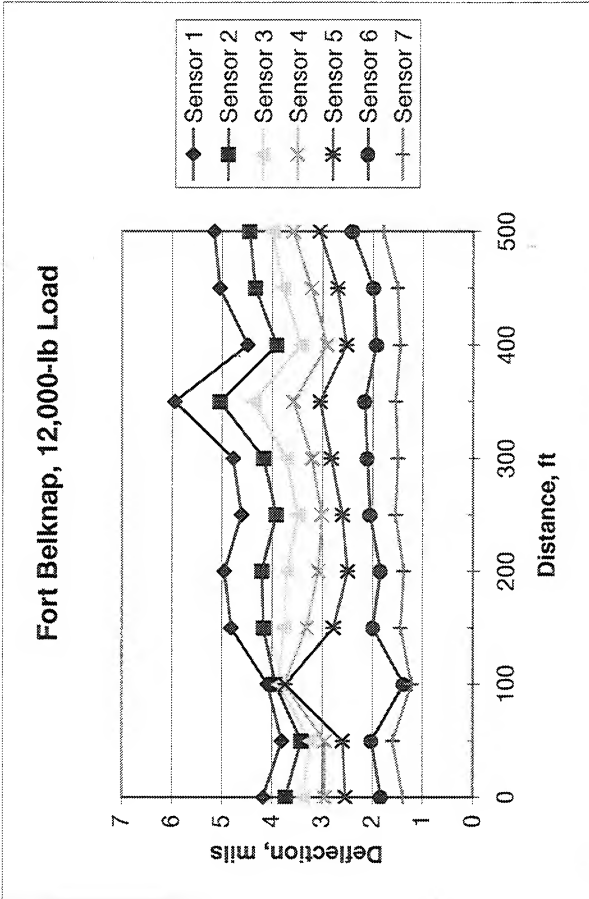
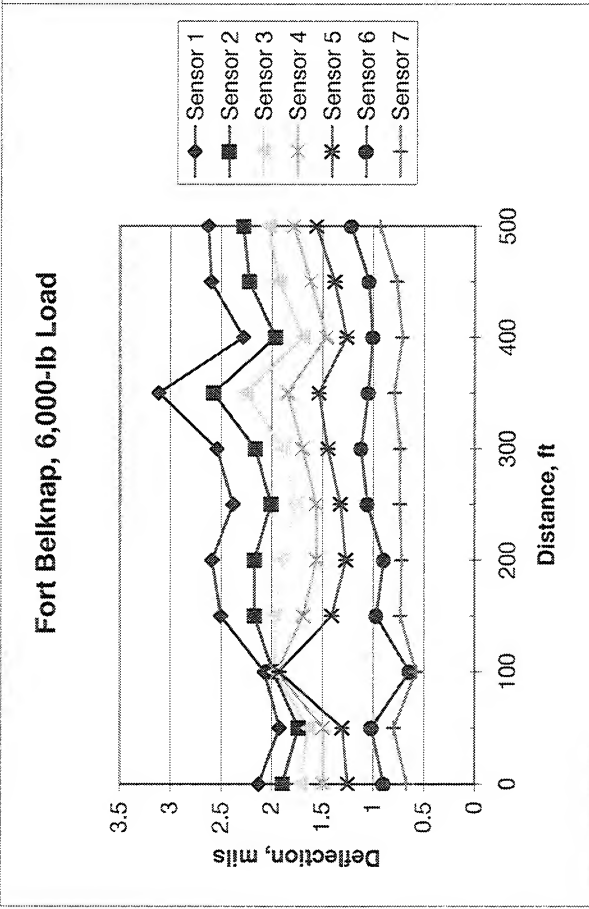
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	6.97	2.95	2.51	2.20	1.97	1.68	1.30	0.85
3+00	9.14	3.78	3.26	2.95	2.52	2.16	1.62	1.19
3+00	11.35	4.52	3.94	3.52	3.03	2.67	1.99	1.41
3+00	14.34	5.52	4.86	4.43	3.74	3.27	2.39	1.80
3+50	6.92	3.59	2.97	2.60	2.13	1.77	1.21	0.91
3+50	9.14	4.65	3.91	3.43	2.80	2.35	1.61	1.17
3+50	11.31	5.60	4.75	4.12	3.37	2.87	2.03	1.45
3+50	14.48	6.93	5.89	5.13	4.29	3.56	2.50	1.83
4+00	6.94	2.64	2.27	1.96	1.69	1.46	1.16	0.82
4+00	9.08	3.41	2.93	2.65	2.29	1.88	1.43	1.09
4+00	11.20	4.19	3.65	3.20	2.71	2.35	1.79	1.35
4+00	14.34	5.26	4.59	4.03	3.50	2.92	2.20	1.69
4+50	6.91	2.99	2.56	2.22	1.86	1.59	1.20	0.88
4+50	9.11	3.86	3.32	2.93	2.45	2.06	1.46	1.16
4+50	11.20	4.71	4.05	3.52	3.00	2.52	1.85	1.40
4+50	14.32	5.88	5.09	4.44	3.72	3.13	2.31	1.80
5+00	6.97	3.05	2.65	2.36	2.07	1.81	1.41	1.08
5+00	9.11	3.95	3.40	3.09	2.74	2.35	1.79	1.41
5+00	11.23	4.83	4.17	3.74	3.35	2.86	2.25	1.67
5+00	14.36	6.00	5.21	4.68	4.15	3.55	2.78	2.18

Fort Belknap, Sensor 1 Deflections



Fort Belknap, Sensor 7 Deflections





**Montana Performance Prediction Models Contract
Field Data Report**

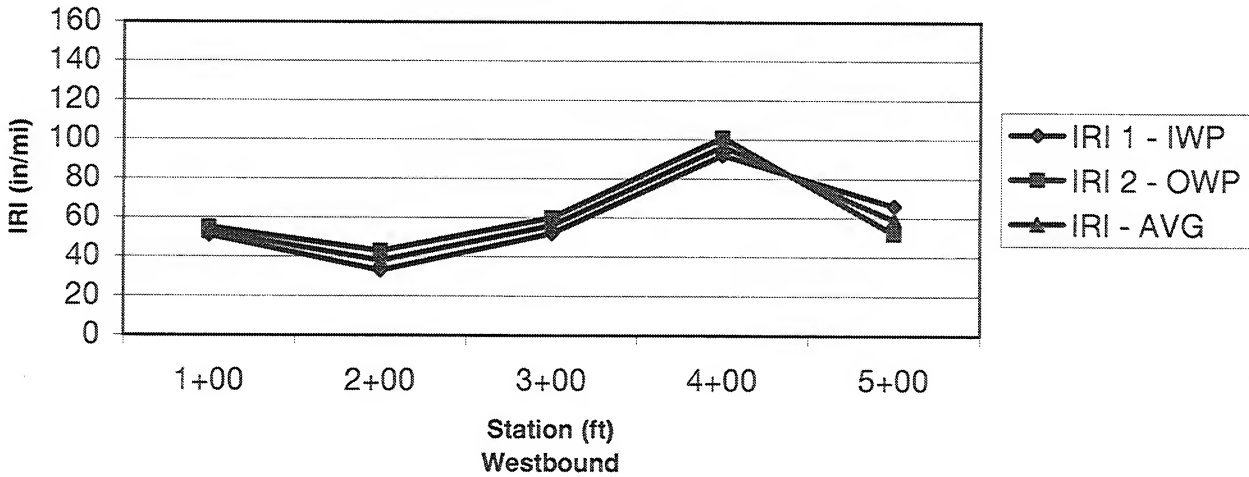
Location: Fort Belknap
 Longitude: 108°30' W
 Latitude: 48°25' N

Profile Data

Test Date: 9/26/01

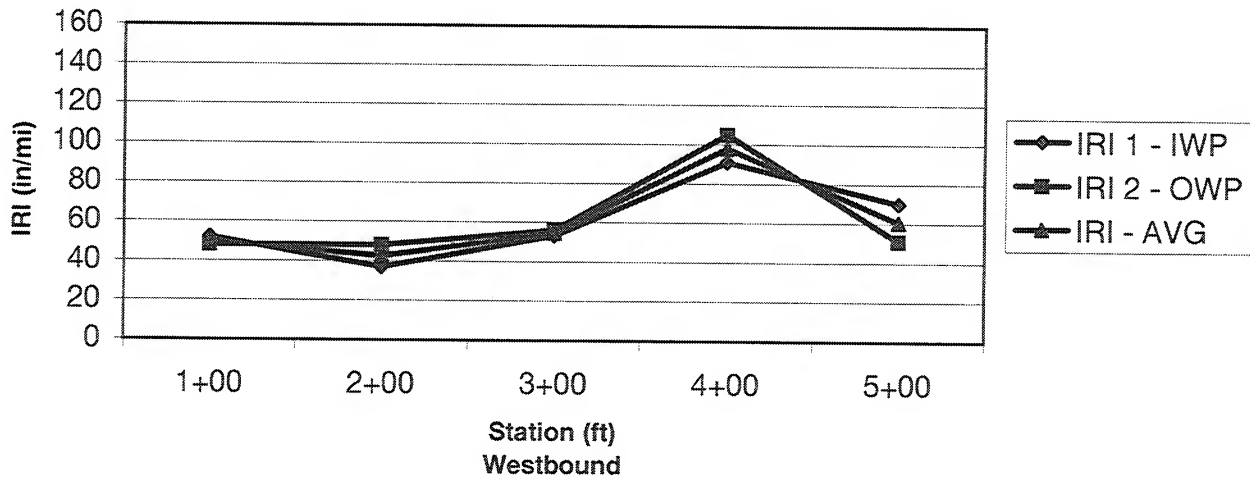
Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.11	0.034	51	55	53
2+00	100	200	100	0.08	0.025	33	43	38
3+00	200	300	100	0.09	0.027	52	60	56
4+00	300	400	100	0.17	0.040	92	101	97
5+00	400	500	100	0.18	0.024	66	52	59
AVG.				0.126	0.030	58.8	62.2	60.5
STD.				0.046	0.007	21.948	22.554	21.685

**Fort Belknap, P-1
Pass #1**

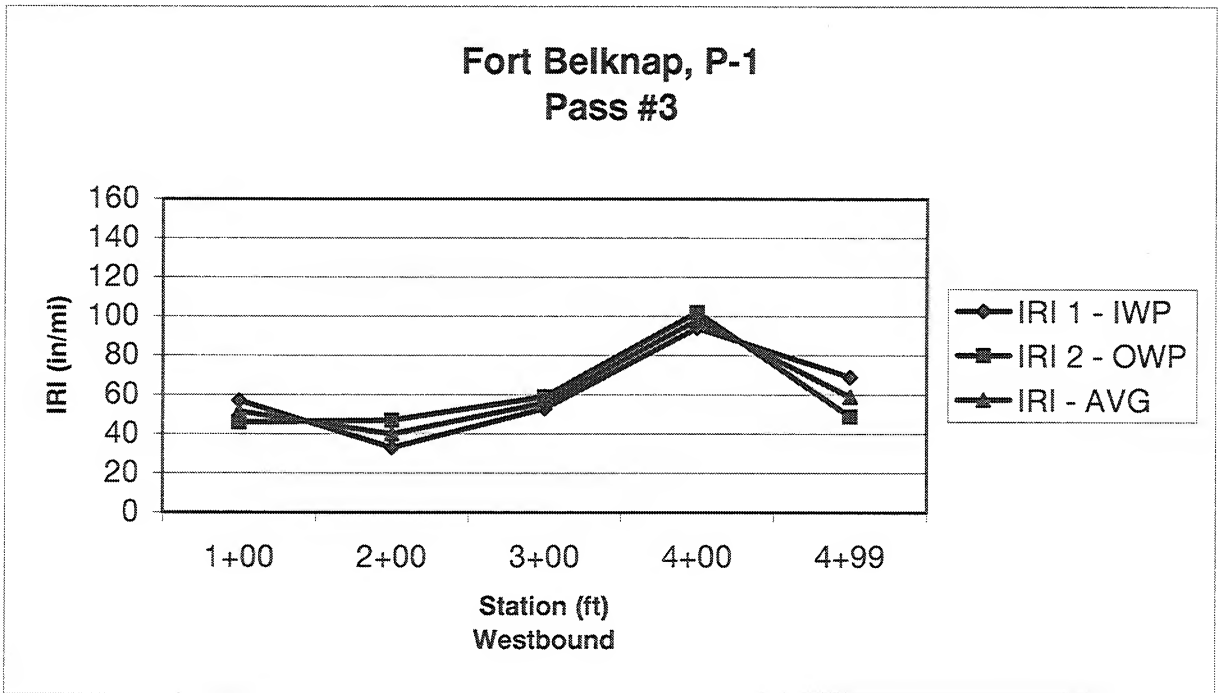


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.09	0.055	52	48	50
2+00	100	200	100	0.02	0.014	37	48	43
3+00	200	300	100	0.07	0.024	53	56	55
4+00	300	400	100	0.16	0.039	91	105	98
5+00	400	500	100	0.17	0.021	70	51	61
AVG.				0.102	0.031	60.6	61.6	61.1
STD.				0.063	0.016	20.623	24.481	21.649

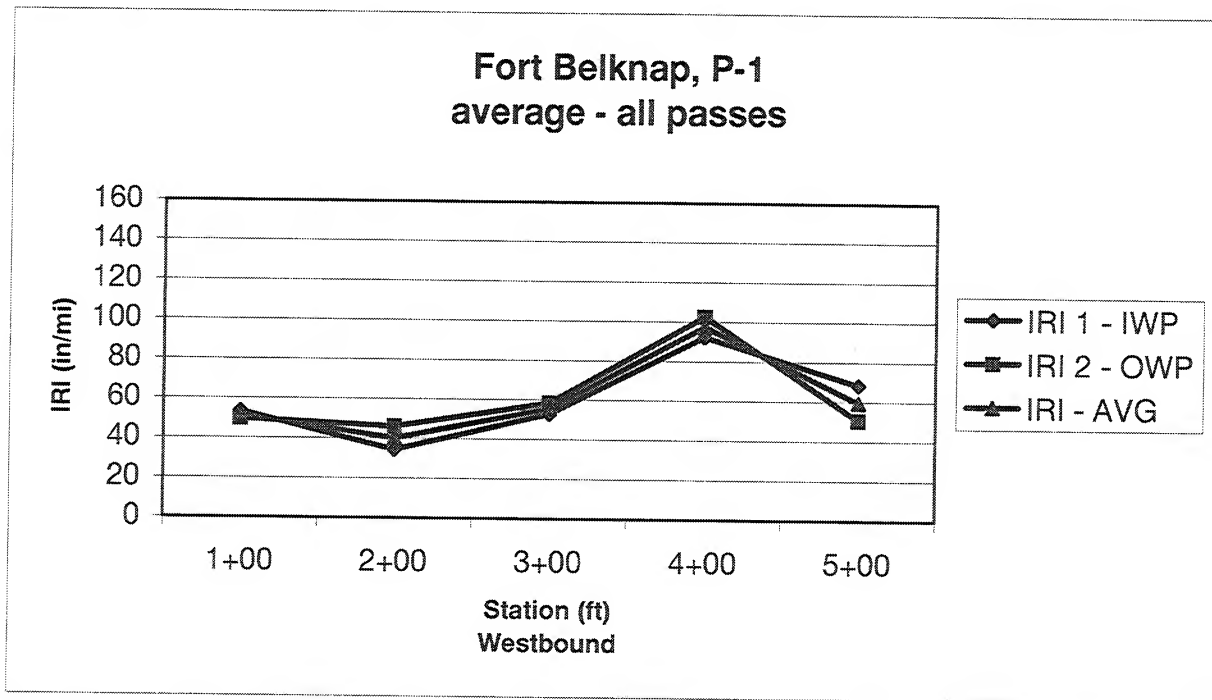
**Fort Belknap, P-1
Pass #2**



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.11	0.036	57	46	52
2+00	100	200	100	0.09	0.023	33	47	40
3+00	200	300	100	0.12	0.024	53	59	56
4+00	300	400	100	0.17	0.039	94	102	98
4+99	400	499	99	0.17	0.022	69	49	59
AVG.				0.132	0.029	61.2	60.6	60.9
STD.				0.036	0.008	22.454	23.713	21.961



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.10	0.042	53	50	52
2+00	100	200	100	0.06	0.021	34	46	40
3+00	200	300	100	0.09	0.025	53	58	56
4+00	300	400	100	0.17	0.039	92	103	98
5+00	400	500	100	0.17	0.022	68	51	60
AVG.				0.120	0.030	60.2	61.5	60.8
STD.				0.048	0.010	21.632	23.465	21.731



APPENDIX H

ROUNDUP

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Roundup
 Longitude: 108°31' W
 Latitude: 46°27' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	4.3	4.3	4.3	
2	CTB	17.7	19.7	18.7	
3	Subgrade	-	-	-	Greenish-Brown Silty Clay (Very Stiff w/ Refusal at D=29 - Bore 1)

Materials Sampling

Date: 4/30/02

Material Type	Quantity	Comments
ACP/CTB	14 cores	2-10" & 12-6" cores. The first core 11 was broken. A new core 11 was taken.
CTB	2 bags	ACP/CTB cores
Subgrade	6 bags, 1 shelby	The subgrade was cohesive but too stiff to take shelby tubes. One small sample was acquired in a shelby tube.

SHRP REGION _____ STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING STATE CODE _____
 LTPP EXPERIMENT Roundup E ROUTE/HIGHWAY N/A-19 Lane _____ SHRP ASSIGNED ID _____
 SAMPLE/TEST: (a) Before Section √ #1 (b) After Section _____ Direction E6
 LOG OF SHOULDER PROBE FIELD SET NO. _____ DCG SHEET: 08
 OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 AUGERING DATE 4-30-02 LOCATION STATION: RP 171 (W. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
12"	1 4 3/8"	PMS	
24"	2 10 7/8"	CTB 1 Ltr 2	Recovered w/ small Rig
36"	3 20"		Sample
48"	4 24"		10 1/4" - 20"
60"	5 30"	brn-greenish gravelly <u>SUBGRADE</u> very stiff clay	SHELLY Tube 2.4" - 2.9"
	6 36"		5" Recov Too hard
	7 42"	30"-38" less cohesive brn clayey gravel	Sample 24"-30"
	8 48"	38"-42" brn gravelly very stiff clay	SHELLY Tube Refusal = .5"
	9 54"	42"-54" less cohesive brn clayey gravel	30"-NA
	10 60"	54"-66" fine brn gravelly very stiff plastic clay	Sample 30"-42"
	11		Sample 54"-66"
	12		
	13		
	14	decreasing gravel	
	15		
	16		
	17	brn very stiff plastic clay	
	18		
	19		
	20		

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - _____ - 19____
 Date

SHRP REGION _____ STATE CODE _____
 STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING
 LTPP EXPERIMENT Roadside E ROUTE/HIGHWAY N/p-14 Lane _____ SHRP ASSIGNED ID _____
 SAMPLE/TEST: (a) Before Section _____ (b) After Section ✓ #2 Direction EB FIELD SET NO. _____
 OPERATOR Dan. M LOG OF SHOULDER PROBE DCG SHEET: 08
 AUGERING DATE 04-30-02 EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 TOP OF ROCK BASED ON: _____ LOCATION STATION: RP 171 (E. End) AUGER PROBE NUMBER _____
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR. OFFSET: _____ feet from 0/s

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	4.5"	PMS	
2	22"	CTB	Sample 10" - 19"
3	36"	gn soft slightly plastic clay	Sample 24" - 30"
4		Subgrade	
5			Sample 30" - 36"
6		oliggn silt/dry fine sand	Sample 60" - 72"
7		Some gravel	
8	8'		
9	9'	oliggn silt plastic clay	
10		gn soft plastic clay	
11		w/some fine gravel	
12			
13			
14			
15			
16			
17			
18			
19			
20			

slightly moist @ 15'

11.39 AM ✓ Done

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____-_____-19_____
 Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Roundup
 Longitude: 108°31' W
 Latitude: 46°27' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/30/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3	EDGE CRACKING (METERS)	0.0	0.0	0.0
4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
5	REFLECTION CRACKING AT JOINTS	Not Recorded		
6	TRANSVERSE CRACKING			
	Number of Cracks	6	0	0
	Length (Meters)	18.0	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION			
	(Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0
8	Potholes			
	(Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Roundup
 Longitude: 108°31' W
 Latitude: 46°27' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 4/30/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9	RUTTING - REFER TO PROFILE DATA	
10	SHOVING (Number)	<input type="text" value="0"/>
	(Square Meters)	<input type="text" value="0.0"/>

SURFACE DEFECTS

11	BLEEDING (Square Meters)	<input type="text" value="0.0"/>
12	POLISHED AGGREGATE (Square Meters)	<input type="text" value="0.0"/>
13	RAVELING (Square Meters)	<input type="text" value="0.0"/>

MISCELLANEOUS DISTRESSES

14	LANE-TO-SHOULDER DROPOFF - Not Recorded	
15	WATER BLEEDING AND PUMPING (Number)	<input type="text" value="0"/>
	Length of Affected Pavement (Meters)	<input type="text" value="0.0"/>
16	OTHER (Describe)	

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Pavement Temp: _____
 Before _____ After _____

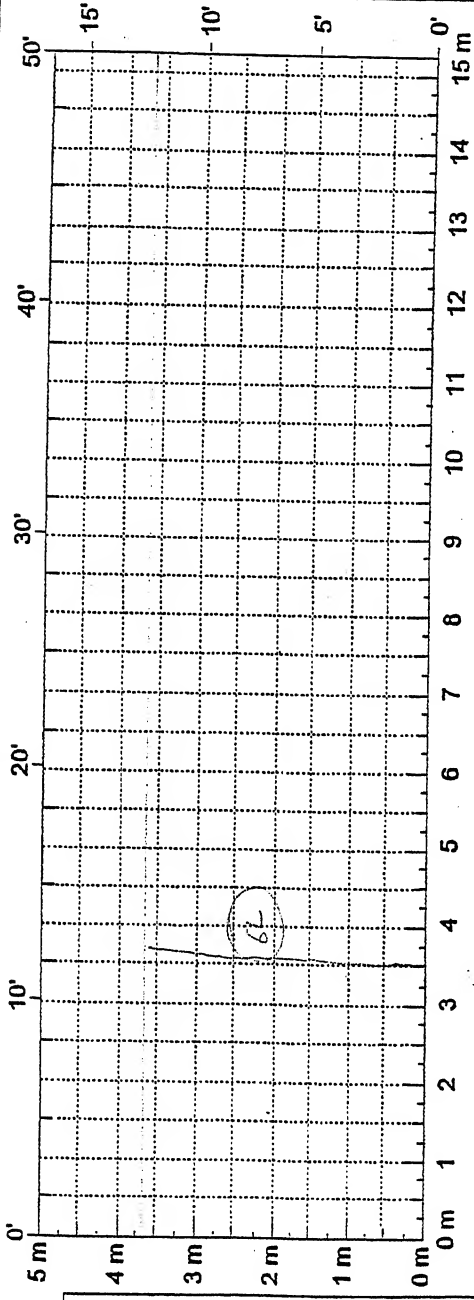
Surveyors: WJ/SB
 Date: 2/20/02

Reviewer: _____
 Date: _____

Section Summary

$\Delta L = 3.66$ (1)
 3.66 (1)
 3.66 (1)
 5.90 (2)
 1.10 (1)

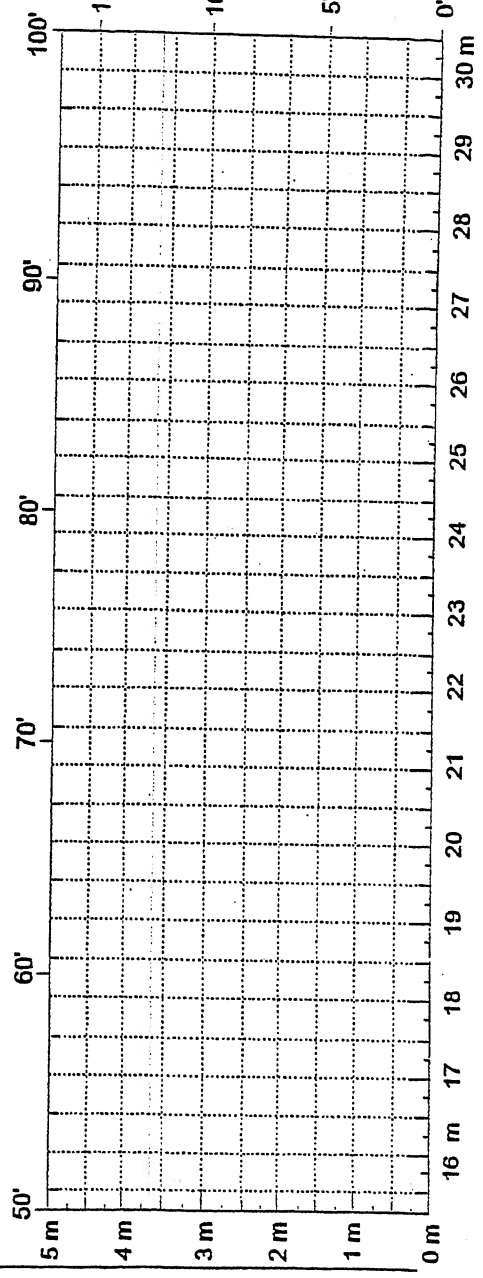
 V.I.A.R. (8)



Sheet Summary

$\Delta L = 3.66$ (1)

Comments: _____



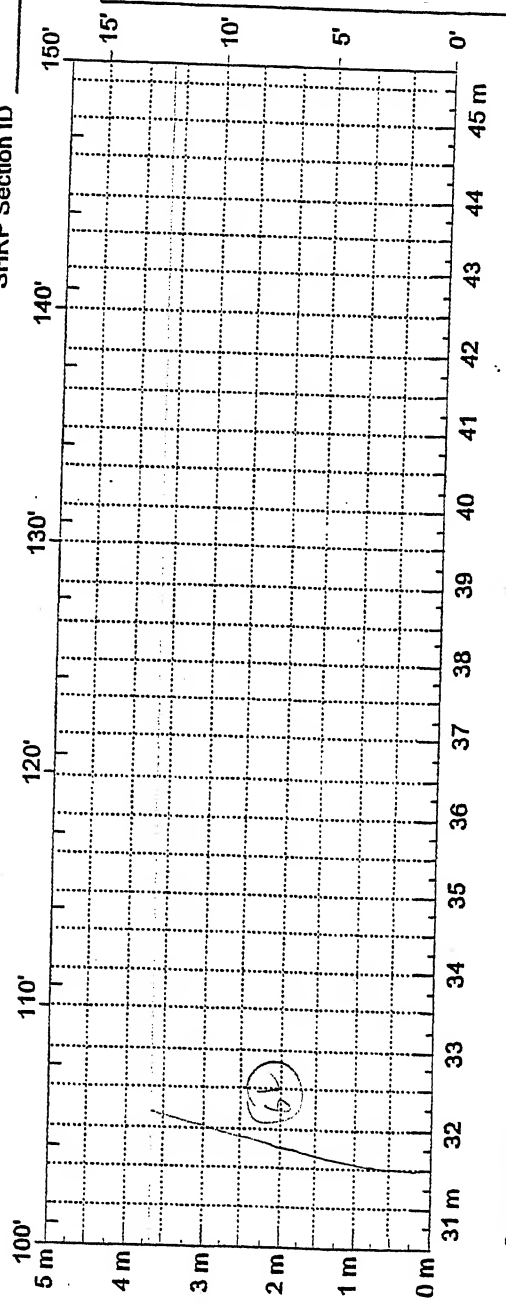
Comments: _____

State Assigned ID _____
State Code _____
SHRP Section ID _____

Reviewer: _____
Date: _____

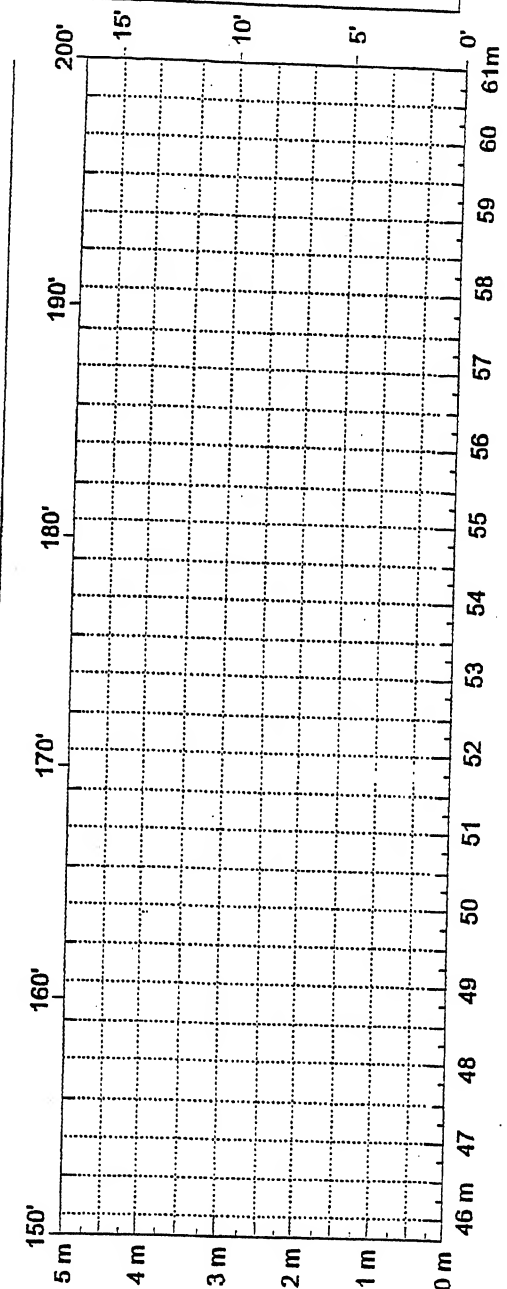
Surveyors: WJ (3)

Date: 4/30/82



Sheet Summary
62 = 31.5 m (1)

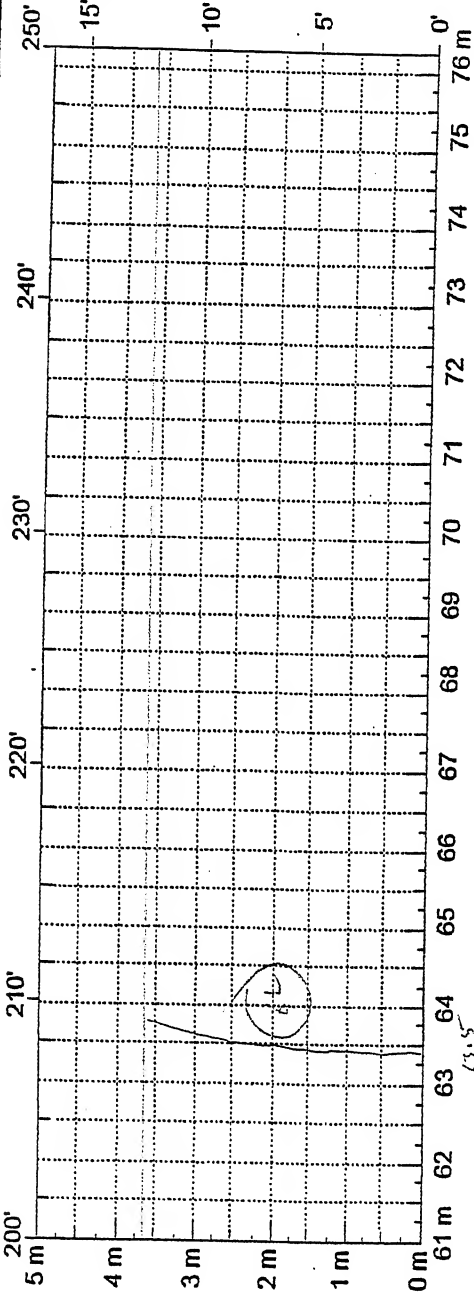
Comments: _____



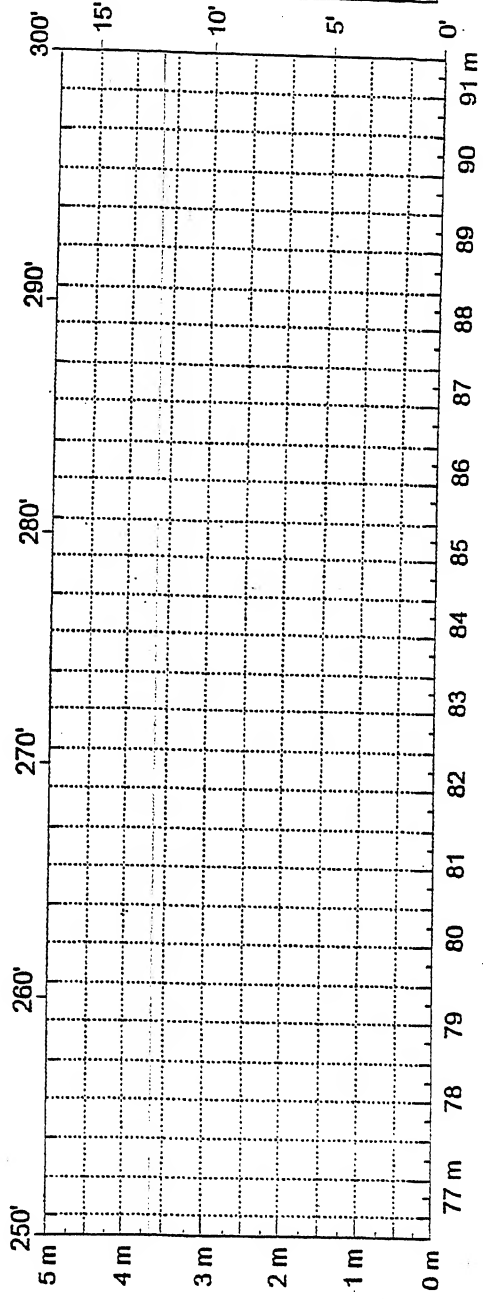
Comments: _____

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____
 Surveyors: WT (B)
 Date: 4/30/03



Comments: _____



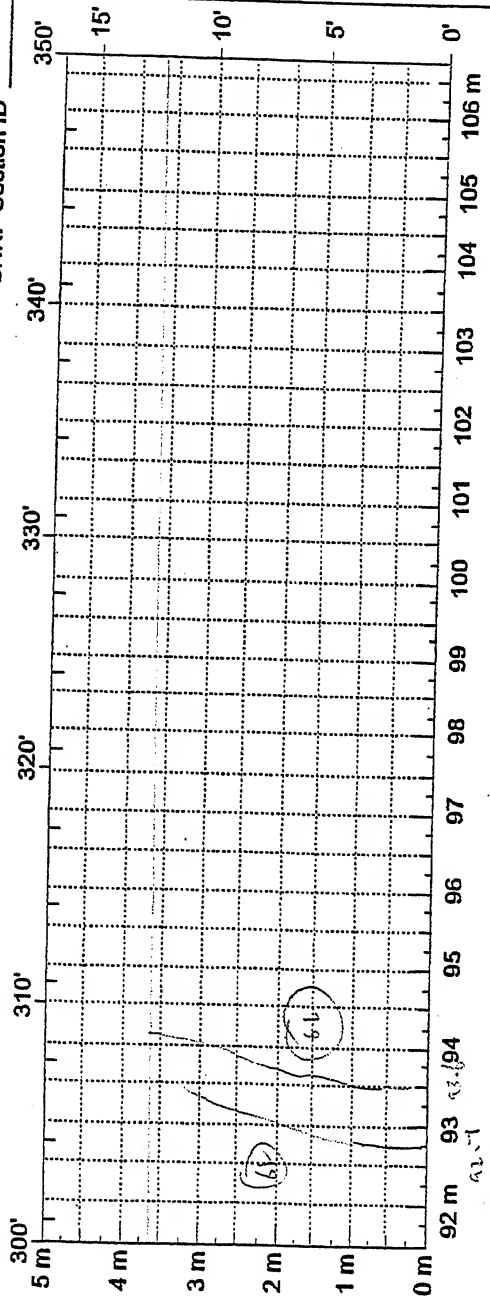
Comments: _____

Sheet Summary

64 = 3.222 ~ (1)

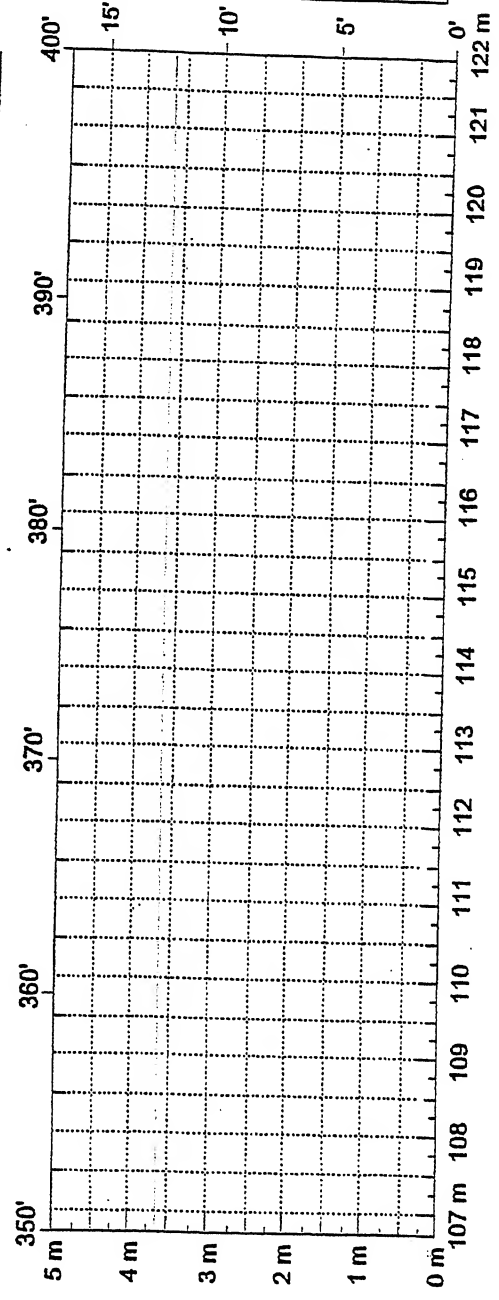
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Date: _____
 Surveyors: LT | SS
 Date: 4/30/02



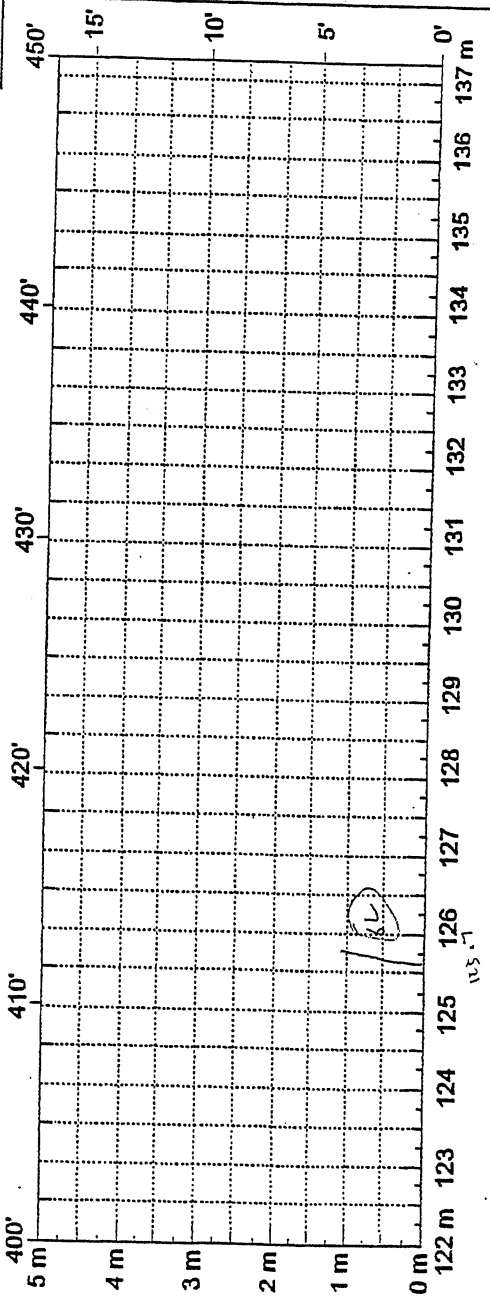
Comments: _____

Sheet Summary
 $6L = 2.54 + 3.41$
 $= 5.95 \text{ (2)}$



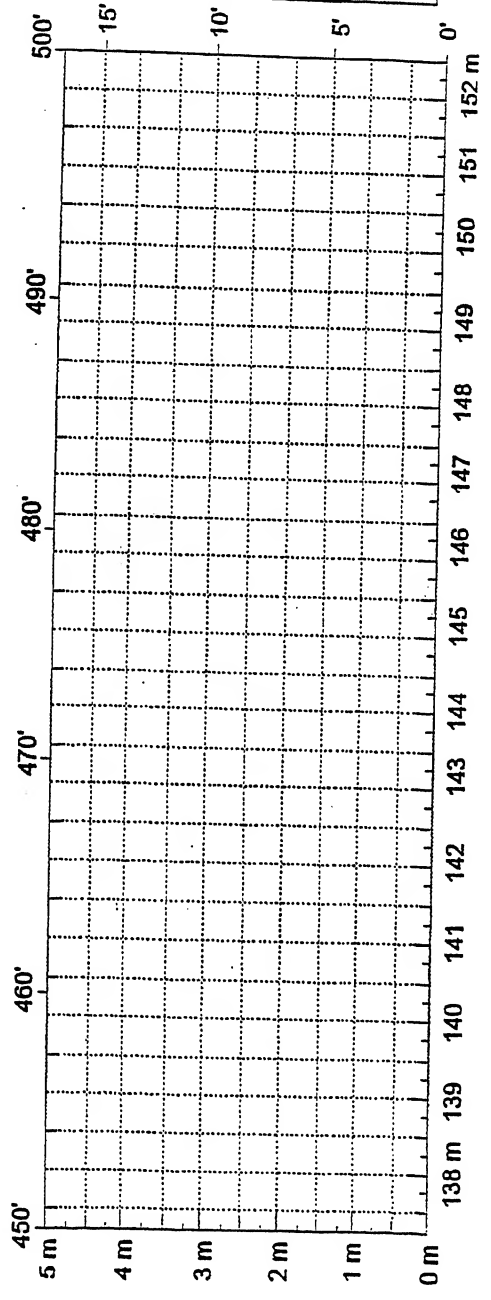
Comments: _____

Reviewer: _____ State Assigned ID _____
 Date: _____ State Code _____
 Surveyors: WJ/BS Pavement Temp: _____
 Date: 4/30/02 After _____
 SHRP Section ID _____



Comments: _____

Sheet Summary
 $\Delta L = 11.1 (m \approx 1)$



Comments: _____

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Roundup
 Longitude: 108°31' W
 Latitude: 46°27' N

FWD Data

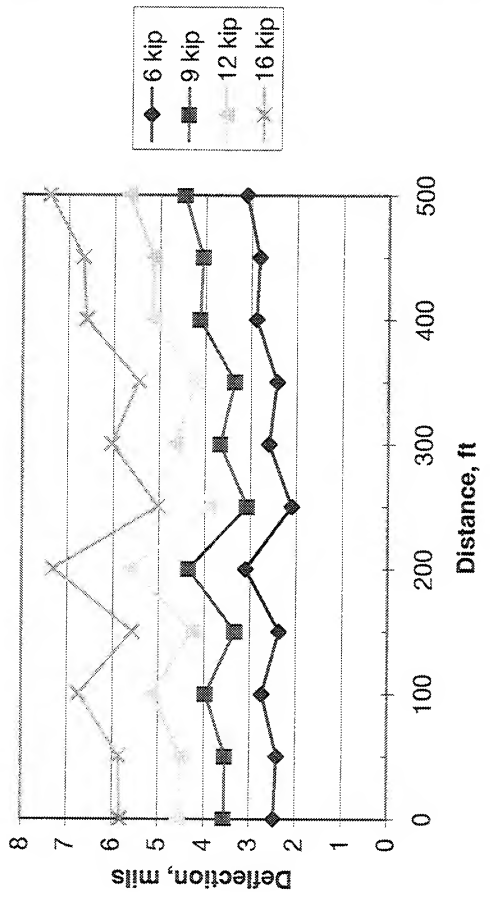
Test Date: 10/9/01

Layer	Material Type	Average Thickness in.
1	ACP	4.3
2	CTB	18.7
3	Subgrade	-

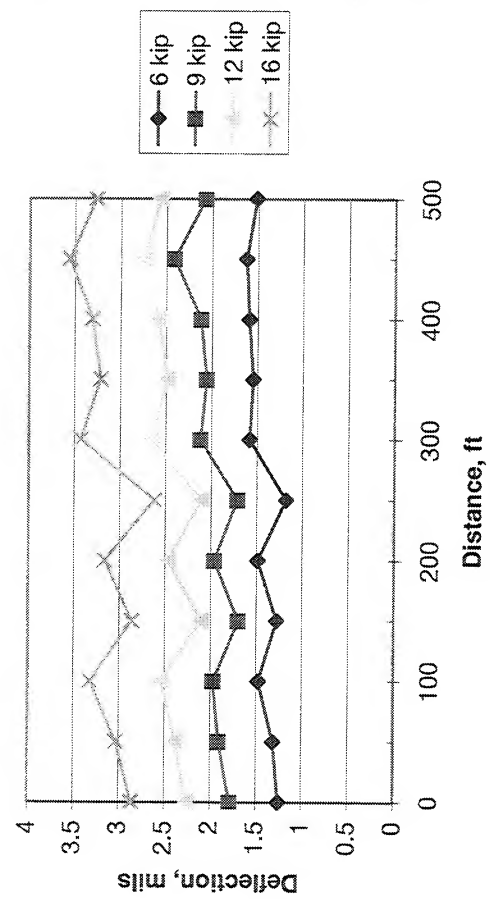
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	7.33	3.02	2.51	2.33	2.18	2.01	1.76	1.53
0+00	11.06	4.36	3.69	3.45	3.18	2.97	2.54	2.19
0+00	13.60	5.16	4.37	4.12	3.79	3.56	3.02	2.56
0+00	15.61	5.68	4.82	4.59	4.16	3.91	3.30	2.79
0+50	7.19	2.88	2.65	2.52	2.39	2.20	1.88	1.57
0+50	10.92	4.28	3.92	3.74	3.54	3.28	2.76	2.31
0+50	13.58	5.09	4.66	4.46	4.14	3.85	3.27	2.69
0+50	15.58	5.71	5.18	4.96	4.61	4.27	3.57	2.95
1+00	7.16	3.26	2.93	2.70	2.54	2.32	2.02	1.76
1+00	10.98	4.83	4.34	4.00	3.76	3.43	2.94	2.40
1+00	13.47	5.76	5.19	4.83	4.45	4.06	3.47	2.85
1+00	15.58	6.57	5.87	5.50	5.04	4.59	3.89	3.23
1+50	7.14	2.81	2.56	2.41	2.27	2.04	1.75	1.52
1+50	11.00	4.07	3.73	3.47	3.19	2.89	2.42	2.07
1+50	13.55	4.81	4.35	4.08	3.70	3.34	2.79	2.38
1+50	15.56	5.42	4.86	4.57	4.11	3.72	3.09	2.78
2+00	7.06	3.64	3.13	2.85	2.65	2.40	2.06	1.75
2+00	10.92	5.27	4.51	4.08	3.77	3.40	2.84	2.38
2+00	13.48	6.30	5.34	4.82	4.41	3.99	3.32	2.77
2+00	15.64	7.14	6.02	5.45	4.97	4.48	3.75	3.09
2+50	7.12	2.49	2.26	2.15	2.02	1.88	1.63	1.40
2+50	10.95	3.73	3.44	3.22	3.04	2.79	2.39	2.08
2+50	13.42	4.34	3.99	3.73	3.53	3.22	2.74	2.35
2+50	15.58	4.89	4.44	4.15	3.85	3.55	2.99	2.55

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	7.07	3.06	2.84	2.72	2.62	2.43	2.14	1.86
3+00	10.92	4.44	4.14	3.93	3.76	3.49	3.03	2.57
3+00	13.44	5.22	4.87	4.62	4.35	4.05	3.45	2.97
3+00	15.58	5.88	5.51	5.20	4.90	4.52	3.89	3.34
3+50	7.03	2.84	2.69	2.58	2.51	2.37	2.11	1.81
3+50	10.85	4.04	3.80	3.63	3.51	3.30	2.85	2.47
3+50	13.41	4.70	4.40	4.23	3.99	3.78	3.29	2.77
3+50	15.57	5.30	4.99	4.77	4.53	4.25	3.67	3.13
4+00	7.06	3.39	3.28	3.05	2.76	2.54	2.18	1.87
4+00	10.80	4.95	4.82	4.43	3.95	3.60	3.01	2.54
4+00	13.38	5.74	5.58	5.17	4.52	4.12	3.47	2.88
4+00	15.53	6.41	6.26	5.77	5.01	4.58	3.82	3.21
4+50	7.03	3.30	3.09	2.93	2.81	2.57	2.21	1.90
4+50	10.80	4.87	4.55	4.31	4.05	3.76	3.17	2.89
4+50	13.31	5.70	5.32	5.08	4.72	4.34	3.68	3.04
4+50	15.37	6.41	6.02	5.70	5.29	4.87	4.13	3.42
5+00	7.06	3.65	3.24	3.02	2.82	2.58	2.13	1.78
5+00	10.87	5.39	4.85	4.48	4.13	3.77	3.15	2.50
5+00	13.38	6.33	5.69	5.27	4.81	4.38	3.59	2.86
5+00	15.47	7.16	6.39	5.91	5.37	4.91	4.03	3.16

Roundup, Sensor 1 Deflections

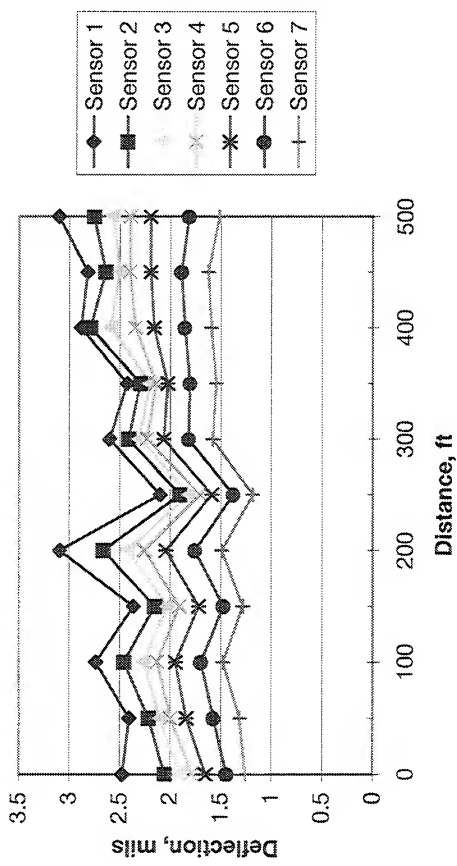


Roundup, Sensor 7 Deflections

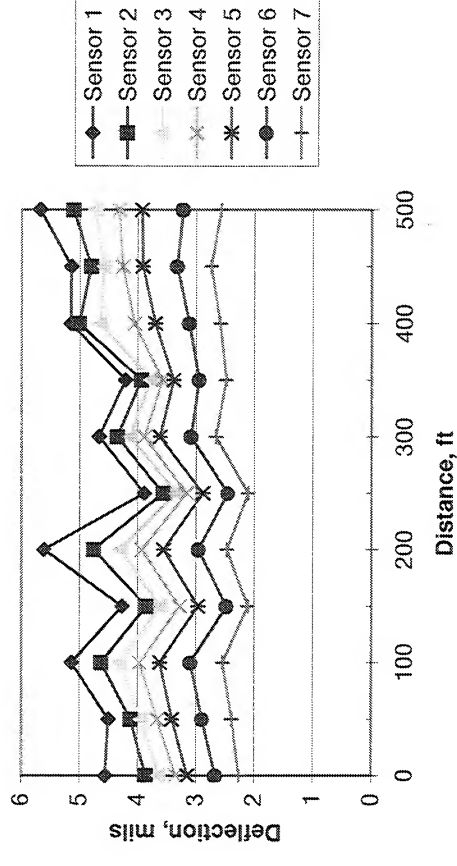


FWD Deflections

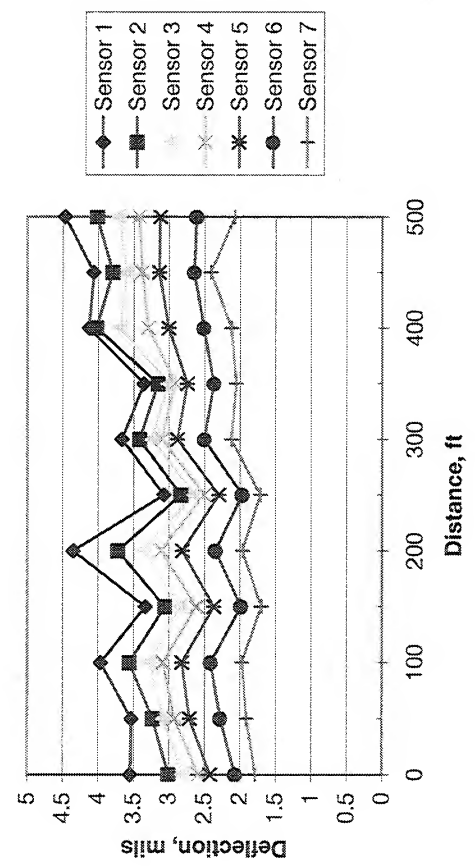
Roundup, 6,000-lb Load



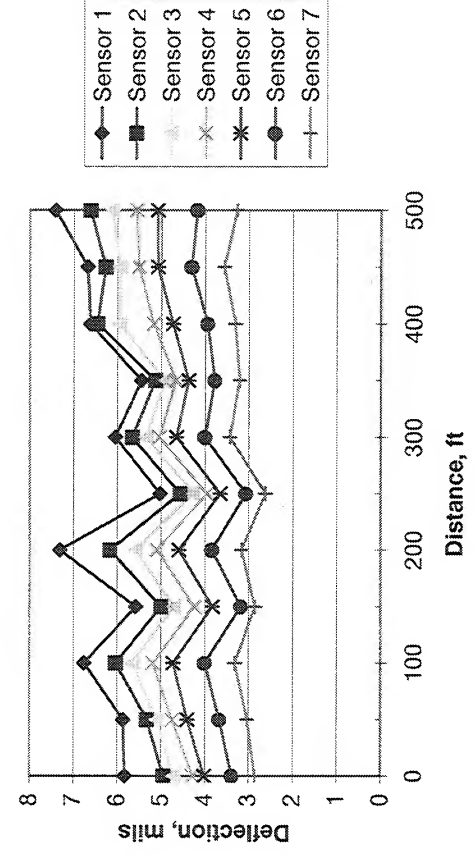
Roundup, 12,000-lb Load



Roundup, 9,000-lb Load



Roundup, 16,000-lb Load



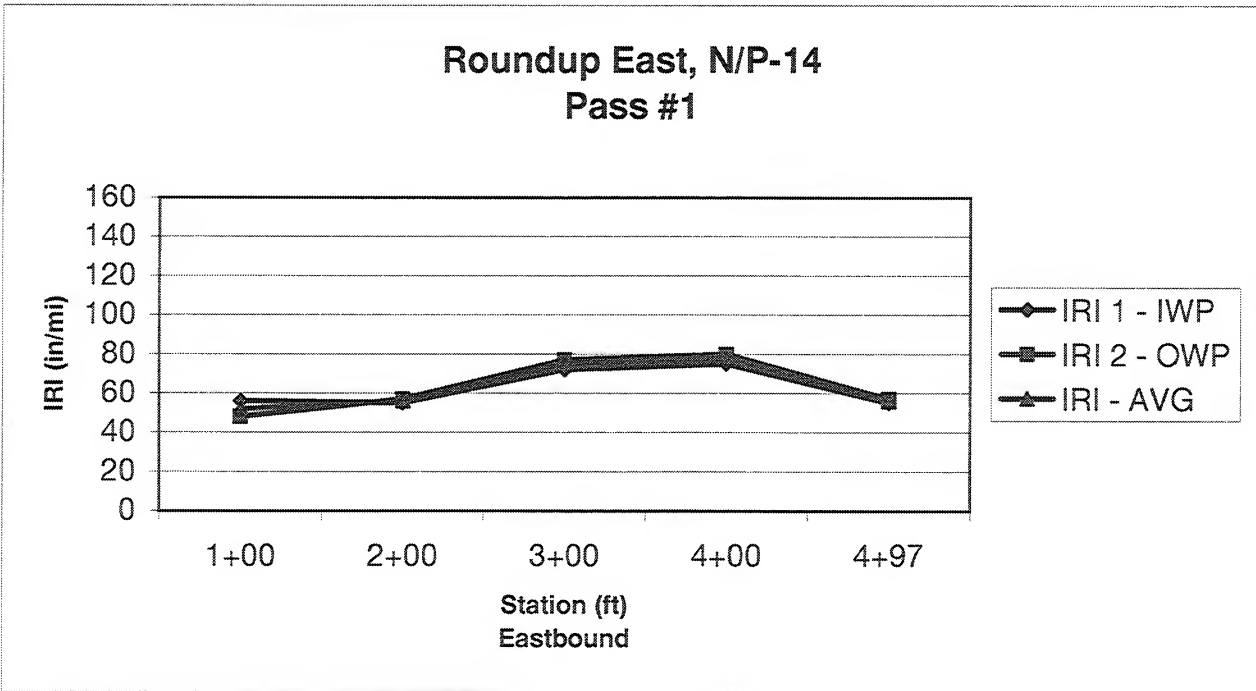
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Roundup
 Longitude: 108°31' W
 Latitude: 46°27' N

Profile Data

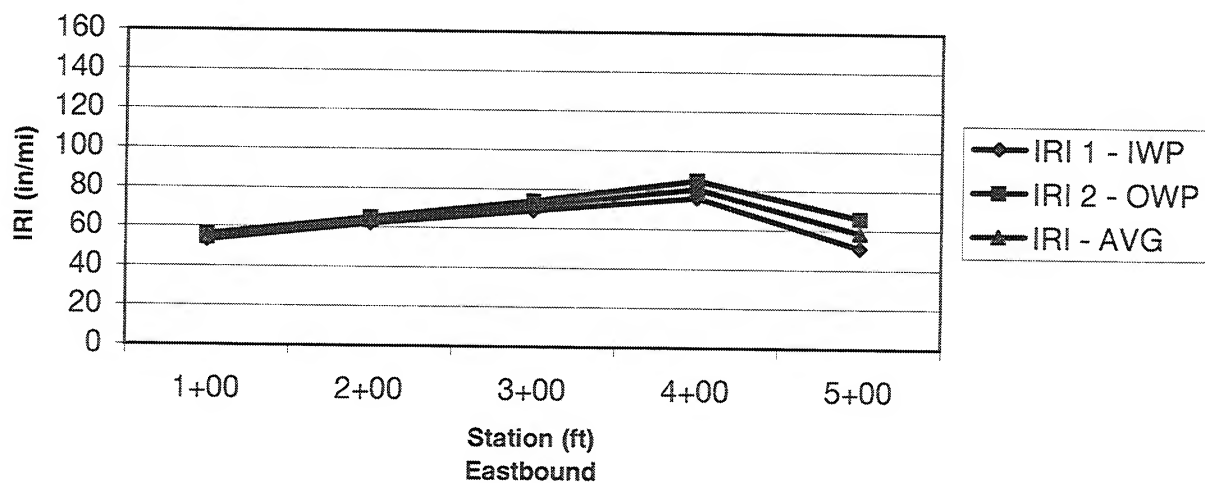
Test Date: 9/27/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.03	0.017	56	48	52
2+00	100	200	100	0.04	0.021	55	57	56
3+00	200	300	100	0.05	0.033	72	77	75
4+00	300	400	100	0.02	0.021	75	80	78
4+97	400	497	97	0.04	0.021	55	57	56
AVG.				0.036	0.023	62.6	63.8	63.2
STD.				0.011	0.006	10.015	13.953	11.846

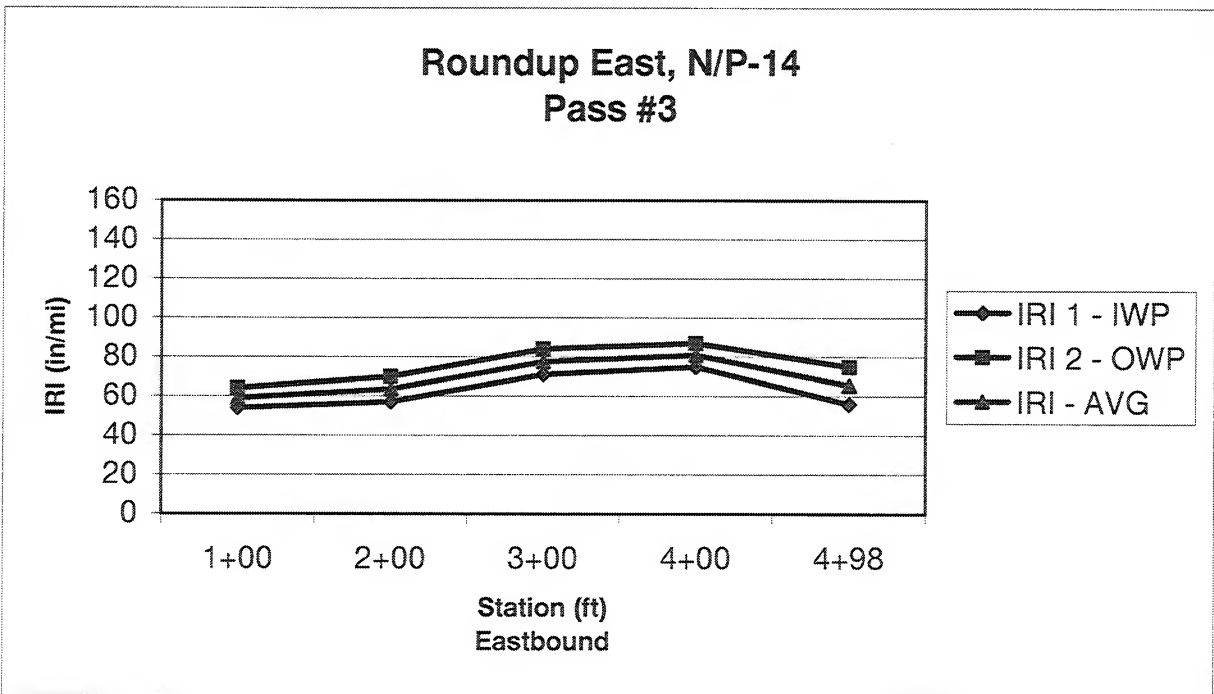


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.03	0.016	53	56	55
2+00	100	200	100	0.02	0.016	62	65	64
3+00	200	300	100	0.05	0.033	69	74	72
4+00	300	400	100	0.03	0.018	76	85	81
5+00	400	500	100	0.04	0.021	51	66	59
AVG.				0.034	0.021	62.2	69.2	65.7
STD.				0.011	0.007	10.569	10.895	10.426

**Roundup East, N/P-14
Pass #2**

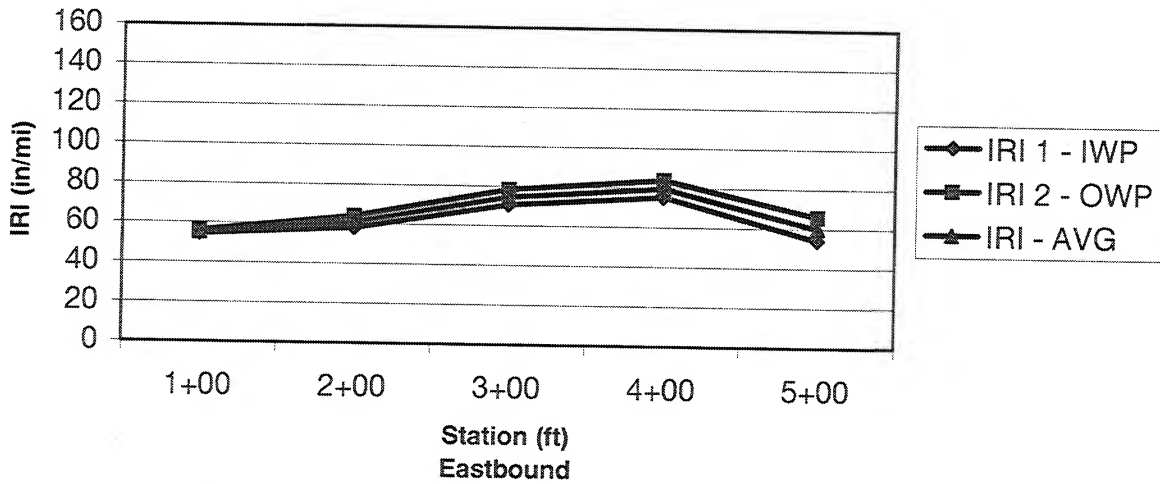


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.03	0.018	54	64	59
2+00	100	200	100	0.03	0.016	57	70	64
3+00	200	300	100	0.05	0.031	71	84	78
4+00	300	400	100	0.03	0.025	75	87	81
4+98	400	498	98	0.03	0.020	56	75	66
AVG.				0.034	0.022	62.6	76	69.3
STD.				0.009	0.006	9.659	9.566	9.464



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.03	0.017	54	56	55
2+00	100	200	100	0.03	0.018	58	64	61
3+00	200	300	100	0.05	0.032	71	78	75
4+00	300	400	100	0.03	0.021	75	84	80
5+00	400	500	100	0.04	0.021	54	66	60
AVG.				0.035	0.022	62.5	69.7	66.1
STD.				0.009	0.006	9.882	11.324	10.457

**Roundup East, N/P-14
average - all passes**



APPENDIX I

LAVINA

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Lavina
 Longitude: 109°05' W
 Latitude: 46°18' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	2.6	3.0	2.8	Chip Seal
2	CTB	16.4	14.0	15.2	
3	Subgrade	-	-	-	Olive-Brwn Silty Clay w/ Some Grvl & Very Fine Sand

Materials Sampling

Date: 5/1/02

Material Type	Quantity	Comments
ACP/CTB	14 cores	2-10" & 12-6" cores
CTB	2 bags	ACP/CTB cores
Subgrade	6 bags, 1 shelby	

SHRP REGION _____
 STATE MT

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____

LTPP EXPERIMENT Laving W ROUTE/HIGHWAY N/P-14 Lane _____ Direction WB
 SAMPLE/TEST: (a) Before Section V#1 (b) After Section _____ FIELD SET NO. _____

LOG OF SHOULDER PROBE

OPERATOR Don M. EQUIPMENT USED _____ SHEET NUMBER _____ OF _____
 AUGERING DATE 5-1-82 LOCATION STATION: RP 139 (E. End) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from 0/s

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	2.5"	PMS	
2	9.5" ^{7"}	CTB ^{Recovered w/cover rig}	
3	17"		Sample 9.5" - 17"
4		subgrade olive brn silty clay Some white sand, gravel	Split Spoon No 17" - 35" Sample
5	4.5		20 Blows → 18"
6		@ 17' ball silt w/shale gravel fragments	
7		brn clayey silt w/gravel	SHELBY TUBE 35" - 47" (Refusal @ 12") 11" Recovered
8			Folded up end
9	9'	brn silty wkly plast clay	
10			Sample x 2 17" - 35"
11	H ₂ O	brn clayey coarse gravel	
12	11' 3.5"		Sample 59" - 71"
13			
14			
15			
16			
17			
18			
19			
20	WET BOTTOM		

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____ - ____ - 19____
 Date

SHRP REGION _____
 STATE MT
 LTPP EXPERIMENT Laving W
 SAMPLE/TEST: (a) Before Section _____ (b) After Section ✓ #2

SHRP-LTPP
 FIELD MATERIAL SAMPLING
 AND FIELD TESTING

STATE CODE _____
 SHRP ASSIGNED ID _____
 Lane _____ Direction W/3
 FIELD SET NO. _____

OPERATOR Dan M. EQUIPMENT USED _____ SHEET NUMBER _____ OF _____
 AUGERING DATE 5-1-02 LOCATION STATION: RP139 (W. E-1) AUGER PROBE NUMBER _____
 TOP OF ROCK BASED ON: _____ OFFSET: _____ feet from °/s
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

LOG OF SHOULDER PROBE

DCG SHEET: 08

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	2.75"	PMS	
2	9.5" ^{7.25"}	CTB: ^A record core	Sample
3	19.0"	Subgrade	9" - 20"
4	22"	brn silty plastic clay w/abund gravel	Sample #2
5	32"		20" - 32"
6		dry-brn interbedded stiff plast. clay and yellow brn silt some gravel	
7			
8		brn clayey silt	Sample
9		grading to brn stiff mod. plastic clay	56" - 68"
10			
11	-H ₂ O 10' 6" -CAVED-	brn stiff plastic silty clay	
12			
13	Damp @ 13'	clayey coarse gravel	
14			
15			
16			
17			
18			
19			
20			

Done 11:13

REFUSAL WITHIN 20 FEET (Y/N): N DEPTH TO REFUSAL: _____ (FEET)

CERTIFIED
G. Zeihen
 Crew Chief, Contractor
 Affiliation: MDT

VERIFIED AND APPROVED

 SHRP Representative
 Affiliation: _____

MONTH-DAY-YEAR
 _____-_____-19_____
 Date

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Lavina
 Longitude: 109°05' W
 Latitude: 46°18' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 5/1/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3	EDGE CRACKING (METERS)	0.0	0.0	0.0
4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	39.9	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
5	REFLECTION CRACKING AT JOINTS	Not Recorded		
6	TRANSVERSE CRACKING			
	Number of Cracks	29	0	0
	Length (Meters)	100.7	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0
8	Potholes (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Lavina
 Longitude: 109°05' W
 Latitude: 46°18' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 5/1/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9	RUTTING - REFER TO PROFILE DATA	
10	SHOVING (Number)	<input type="text" value="0"/>
	(Square Meters)	<input type="text" value="0.0"/>

SURFACE DEFECTS

11	BLEEDING (Square Meters)	<input type="text" value="0.0"/>
12	POLISHED AGGREGATE (Square Meters)	<input type="text" value="0.0"/>
13	RAVELING (Square Meters)	<input type="text" value="0.0"/>

MISCELLANEOUS DISTRESSES

14	LANE-TO-SHOULDER DROPOFF - Not Recorded	
15	WATER BLEEDING AND PUMPING (Number)	<input type="text" value="0"/>
	Length of Affected Pavement (Meters)	<input type="text" value="0.0"/>
16	OTHER (Describe) <u>Rutting was measurable on the second half of the</u> <u>section</u>	

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

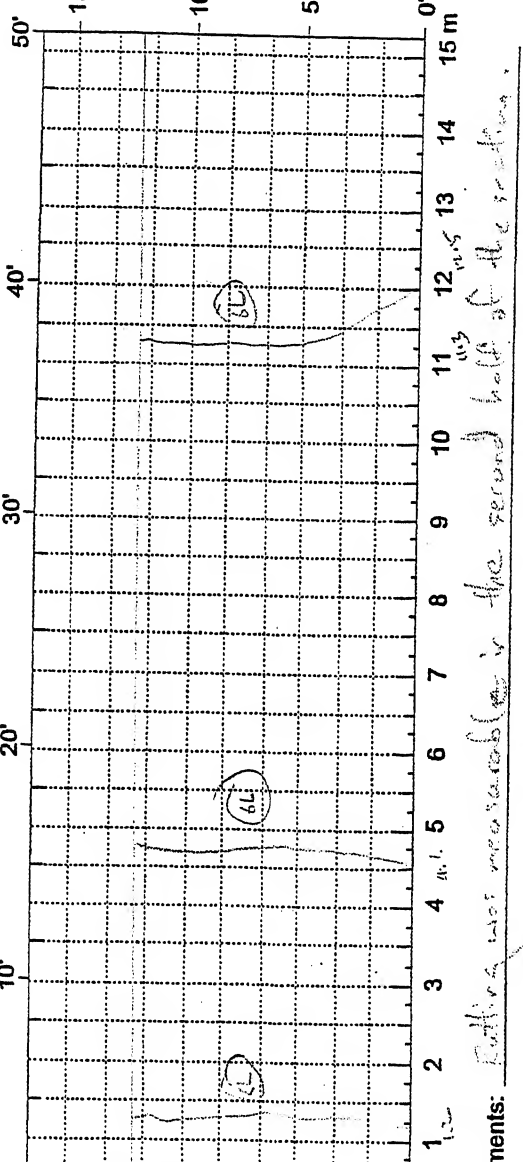
Pavement Temp: _____
 Before _____ After _____

Surveyors: WT/RS
 Date: 5/1/02

Reviewer: _____
 Date: _____

Section Summary

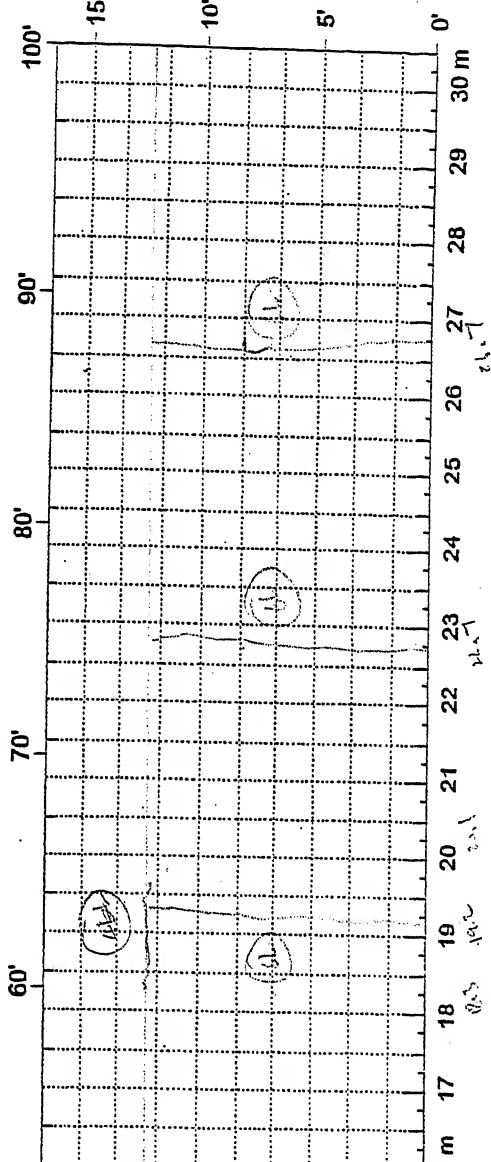
21.46 (6)
 25.62 (5)
 18.30 (5)
 23.87 (8)
 10.42 (3)
 100.13 (79)
 46L = 1.8714 + 0.4
 415.84207
 = 39.9m



Comments: Rating was measurable in the second half of the section.

Sheet Summary

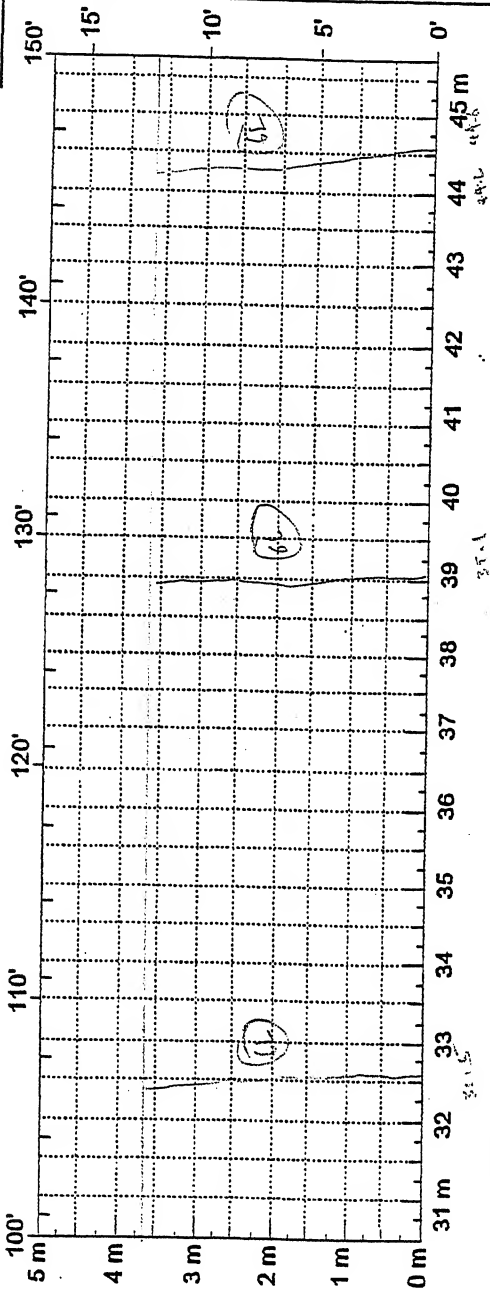
21.46 (6)
 25.62 (5)
 18.30 (5)
 23.87 (8)
 10.42 (3)
 100.13 (79)
 46L = 1.8714 + 0.4
 415.84207
 = 39.9m



Comments: _____

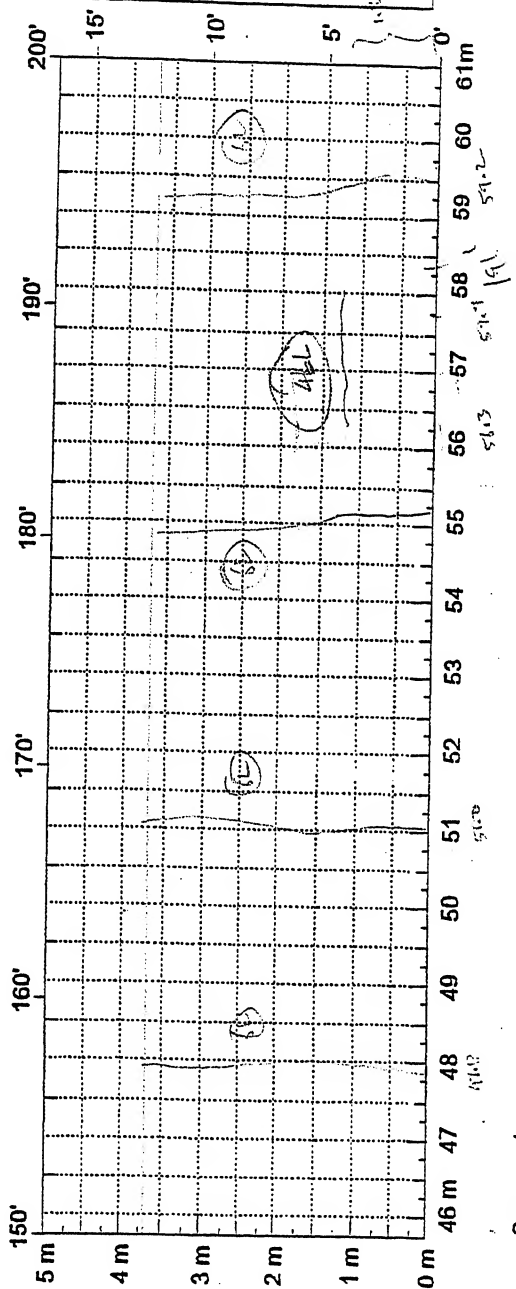
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Surveyors: WT (133)
 Date: 5/1/02



Sheet Summary
 61 = 7.85 + 7.66 + 7.66
 + 7.66 + 7.66 + 7.66
 + 7.66
 = 15.52 (1)
 15.52 - 1.42 = 14.10

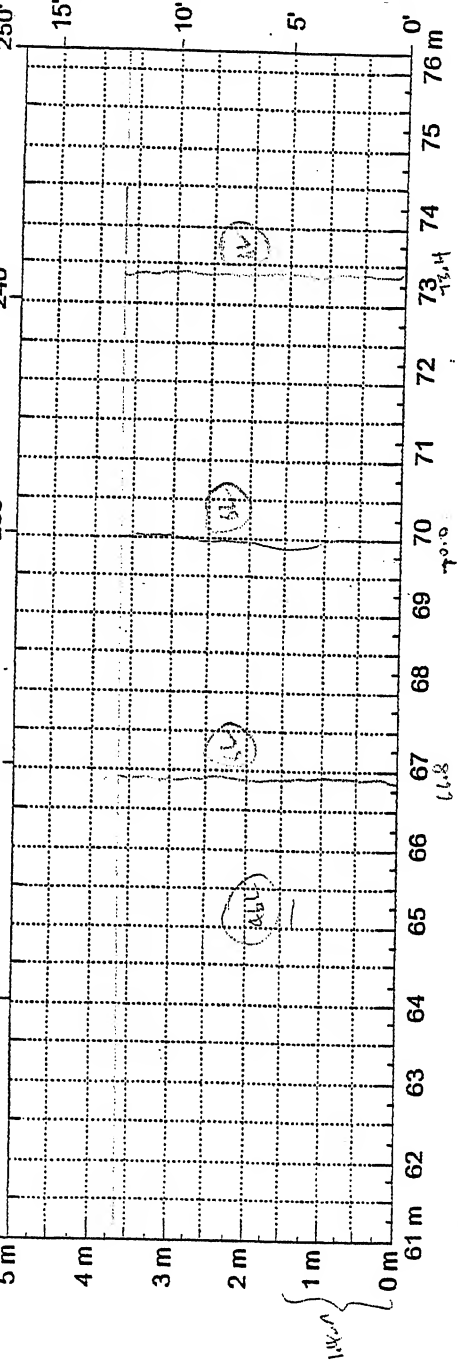
Comments: _____



Comments: _____

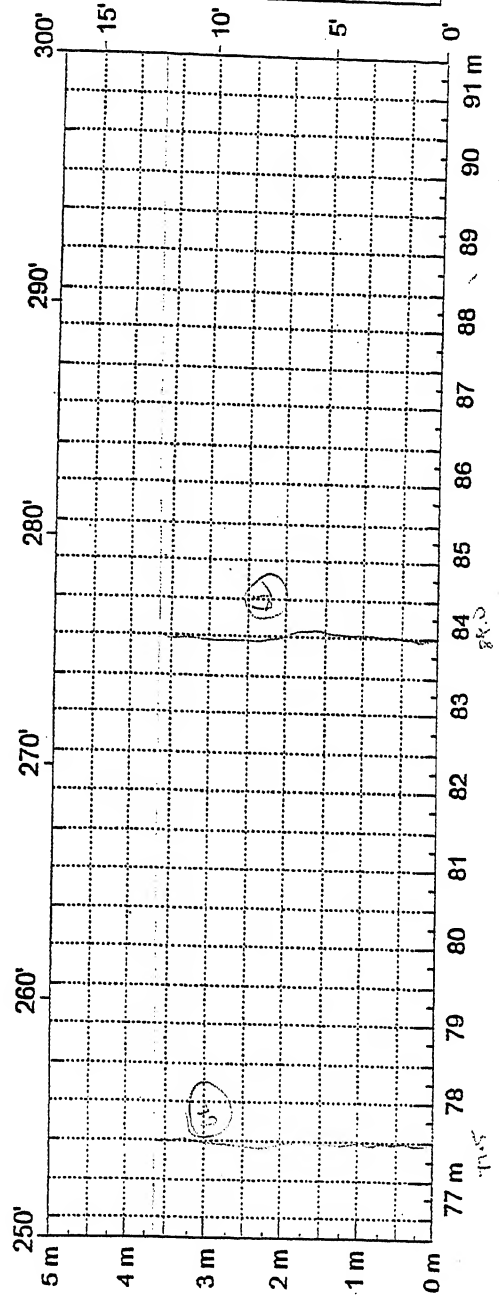
State Assigned ID _____
 State Code _____

SHRP Section ID _____



Comments: _____

Sheet Summary
 0.2 + 3.6 (10.5) 4.4 3.6 8
 4.3 6.6 3.6 6
 = 18.3 (10.5)
 4.4 0.4 m



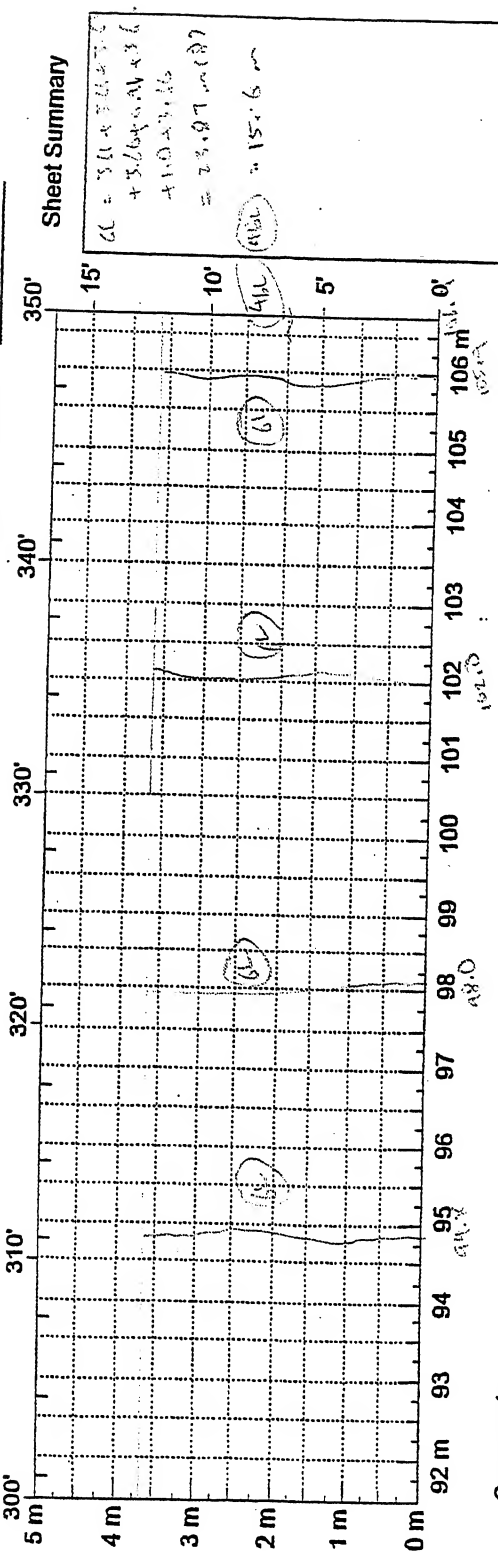
Comments: _____

Reviewer: _____
 Date: 5/1/82

Surveyors: WJ (55)
 Date: 5/1/82

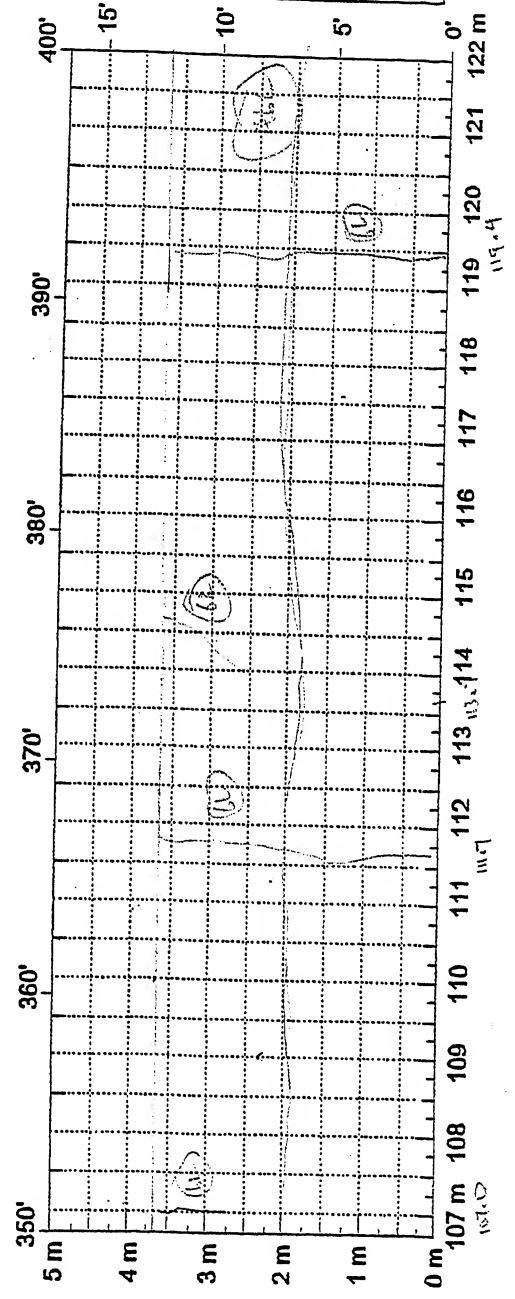
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Reviewer: _____
 Surveyors: WT/BS
 Date: 5/1/02



Sheet Summary
 $CC = 311 \times 3.6 \times 3.6$
 $+ 3.6 \times 3.6 \times 3.6$
 $+ 11.0 \times 3.6$
 $= 23,977 \text{ m}^2 (87)$
 $(15) \times 15 = 225$

Comments: _____



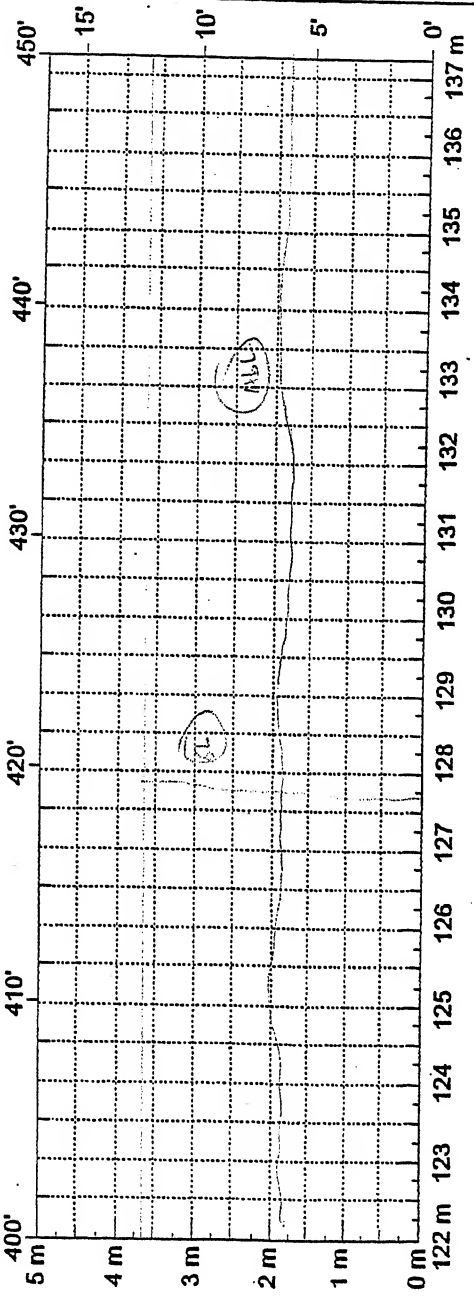
Comments: _____

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Pavement Temp: _____
 After _____

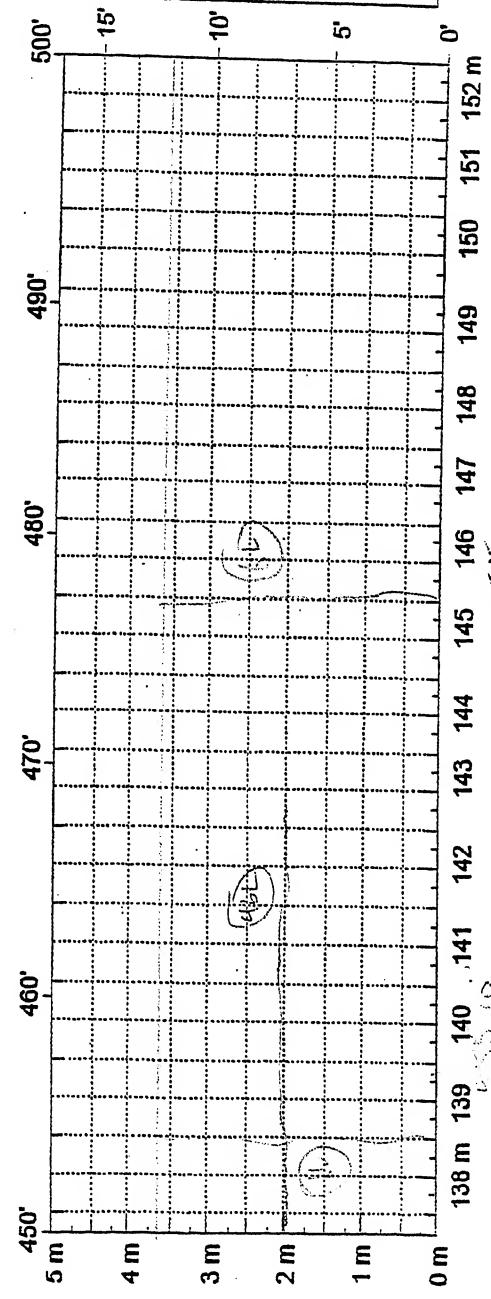
Reviewer: _____
 Date: 5/1/82

Surveyors: JTB



Comments: _____

Sheet Summary
 W = 3.16 + 3.16
 + 3.16
 = 10.48 (33)
 ABL = 10.48 m



Comments: _____

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Lavina
 Longitude: 109°05' W
 Latitude: 46°18' N

FWD Data

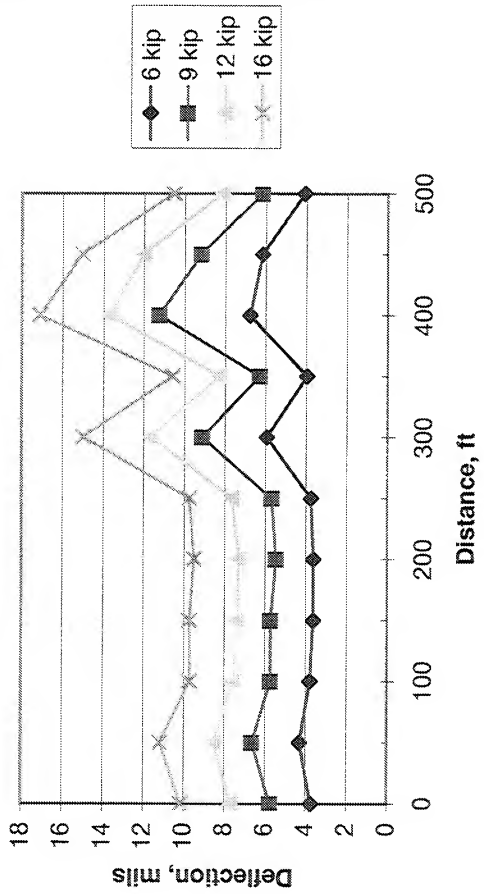
Test Date: 10/10/01

Layer	Material Type	Average Thickness in.
1	ACP	2.8
2	CTB	15.2
3	Subgrade	-

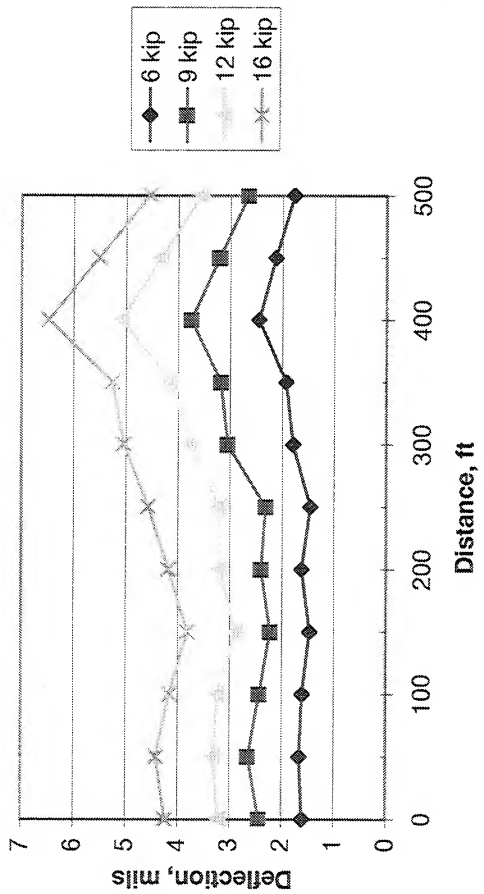
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	6.87	4.27	4.00	3.77	3.54	3.21	2.48	1.84
0+00	9.09	5.79	5.43	5.15	4.75	4.34	3.33	2.46
0+00	11.49	7.37	6.89	6.54	6.05	5.51	4.22	3.08
0+00	15.31	9.73	9.12	8.70	7.96	7.26	5.52	4.05
0+50	6.80	4.86	4.50	4.22	3.82	3.35	2.53	1.88
0+50	8.99	6.61	6.19	5.79	5.30	4.66	3.57	2.64
0+50	11.50	8.16	7.63	7.14	6.44	5.71	4.30	3.17
0+50	15.33	10.70	10.04	9.43	8.48	7.53	5.73	4.23
1+00	6.83	4.30	3.98	3.74	3.43	3.07	2.39	1.83
1+00	9.01	5.72	5.31	4.99	4.57	4.09	3.20	2.43
1+00	11.46	7.21	6.71	6.28	5.86	5.19	4.05	3.09
1+00	15.24	9.26	8.70	8.21	7.49	6.72	5.24	3.96
1+50	6.85	4.13	3.67	3.43	3.09	2.76	2.12	1.67
1+50	9.11	5.78	5.08	4.76	4.30	3.82	2.96	2.25
1+50	11.49	7.07	6.24	5.85	5.27	4.68	3.64	2.77
1+50	15.47	9.40	8.36	7.83	7.07	6.29	4.82	3.68
2+00	6.87	4.15	3.92	3.75	3.37	2.98	2.36	1.85
2+00	9.04	5.49	5.20	4.90	4.44	3.93	3.12	2.41
2+00	11.58	7.04	6.64	6.33	5.63	5.02	3.98	3.08
2+00	15.31	9.10	8.66	8.22	7.29	6.48	5.14	4.00
2+50	6.69	4.19	3.79	3.60	3.37	3.08	2.29	1.62
2+50	8.79	5.55	5.10	4.85	4.55	4.15	3.09	2.26
2+50	11.24	7.17	6.63	6.25	5.88	5.36	3.99	3.00
2+50	15.08	9.19	8.53	8.08	7.53	6.84	5.10	4.31

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	6.74	6.67	5.69	5.09	4.43	3.76	2.74	2.01
3+00	8.95	9.06	7.85	7.07	6.18	5.32	4.00	3.03
3+00	11.30	10.97	9.59	8.60	7.49	6.45	4.78	3.53
3+00	15.11	14.16	12.45	11.25	9.77	8.46	6.30	4.76
3+50	6.72	4.43	4.21	3.99	3.75	3.41	2.80	2.15
3+50	8.94	6.24	5.91	5.64	5.34	4.84	4.00	3.15
3+50	11.39	7.87	7.53	7.14	6.69	6.11	5.00	3.92
3+50	15.20	10.07	9.71	9.12	8.52	7.79	6.38	5.00
4+00	6.15	6.93	6.32	5.94	5.34	4.66	3.44	2.51
4+00	8.26	10.33	8.53	7.98	7.22	6.26	4.62	3.44
4+00	10.48	11.96	10.70	10.03	9.00	7.89	5.85	4.44
4+00	13.98	14.96	13.65	12.67	11.42	9.92	7.43	5.66
4+50	6.73	6.90	6.12	5.69	5.12	4.48	3.34	2.38
4+50	8.93	9.11	8.14	7.55	6.79	5.96	4.49	3.18
4+50	11.27	11.27	10.14	9.40	8.48	7.46	5.65	4.06
4+50	15.34	14.42	13.12	12.15	10.93	9.65	7.38	5.29
5+00	6.79	4.61	4.42	4.16	3.79	3.38	2.63	2.00
5+00	8.98	6.16	5.95	5.61	5.11	4.53	3.49	2.65
5+00	11.38	7.74	7.48	7.01	6.42	5.70	4.42	3.37
5+00	15.40	10.13	9.87	9.29	8.41	7.45	5.76	4.37

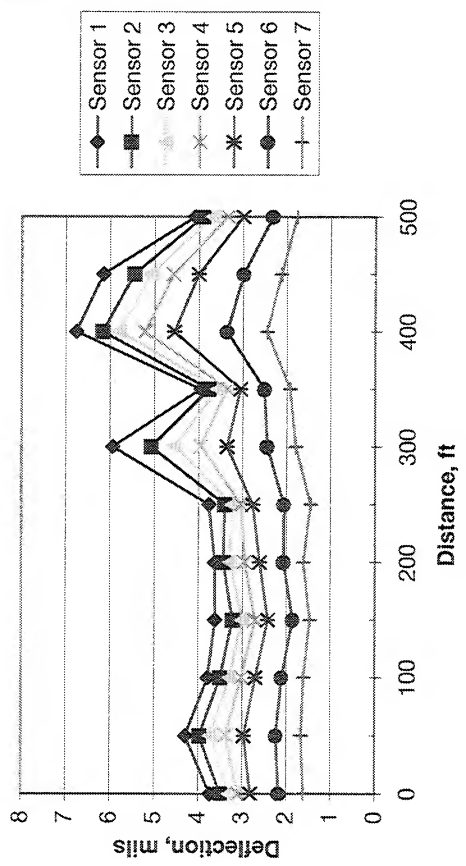
Lavina, Sensor 1 Deflections



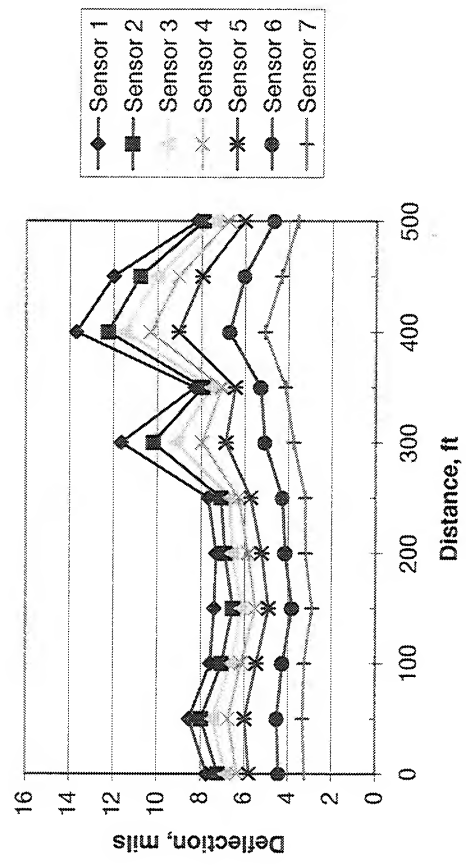
Lavina, Sensor 7 Deflections



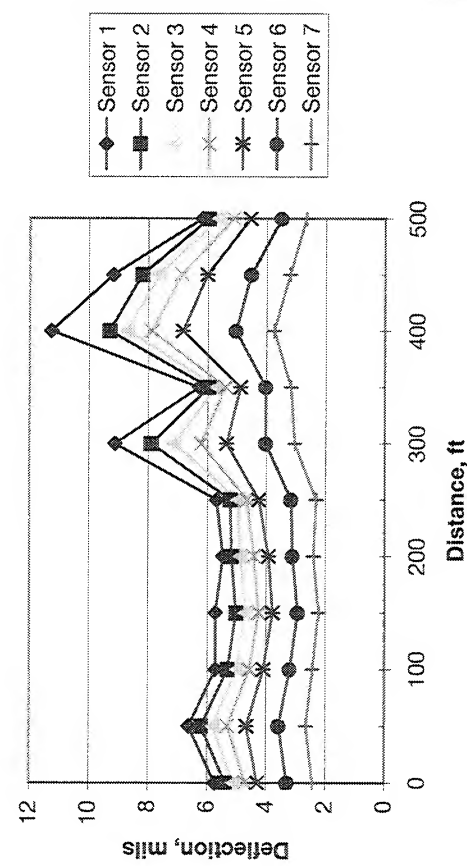
Lavina, 6,000-lb Load



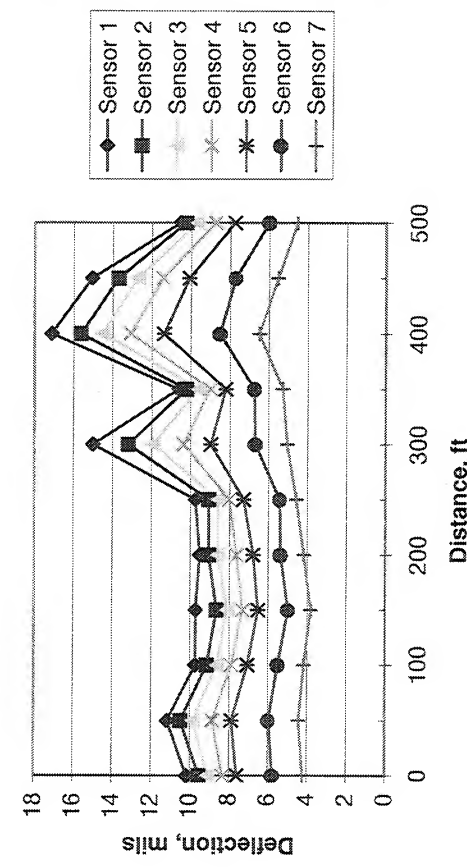
Lavina, 12,000-lb Load



Lavina, 9,000-lb Load



Lavina, 16,000-lb Load



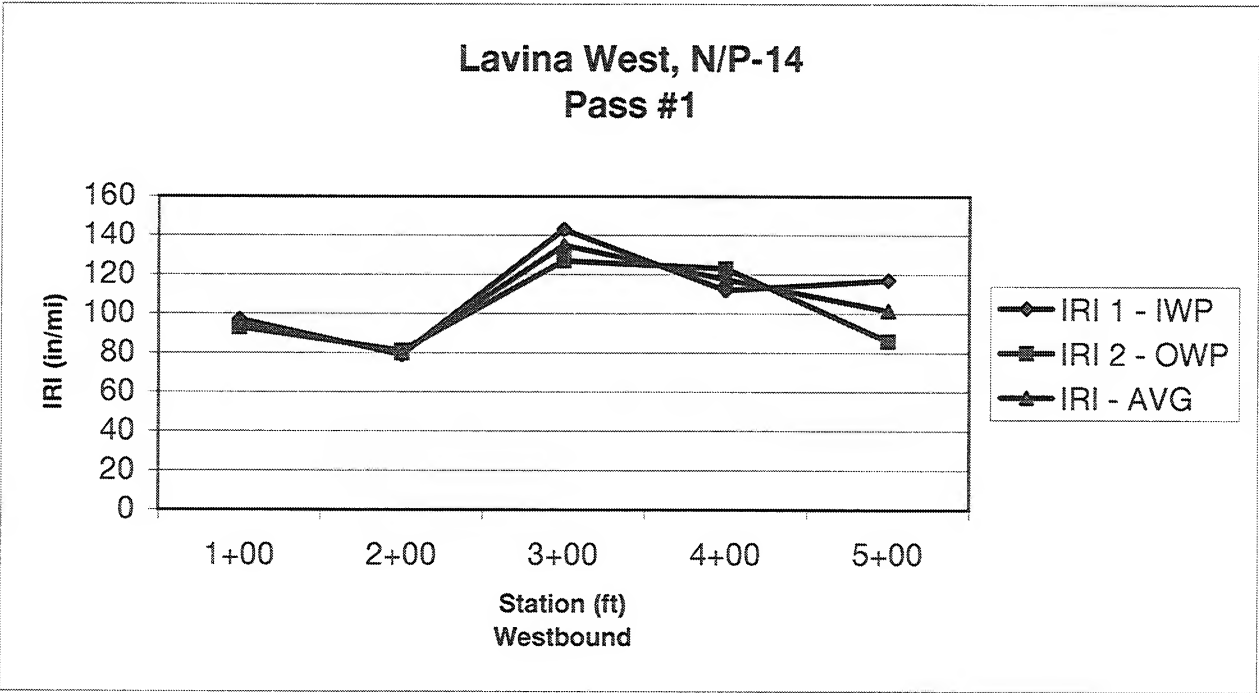
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Lavina
 Longitude: 109°05' W
 Latitude: 46°18' N

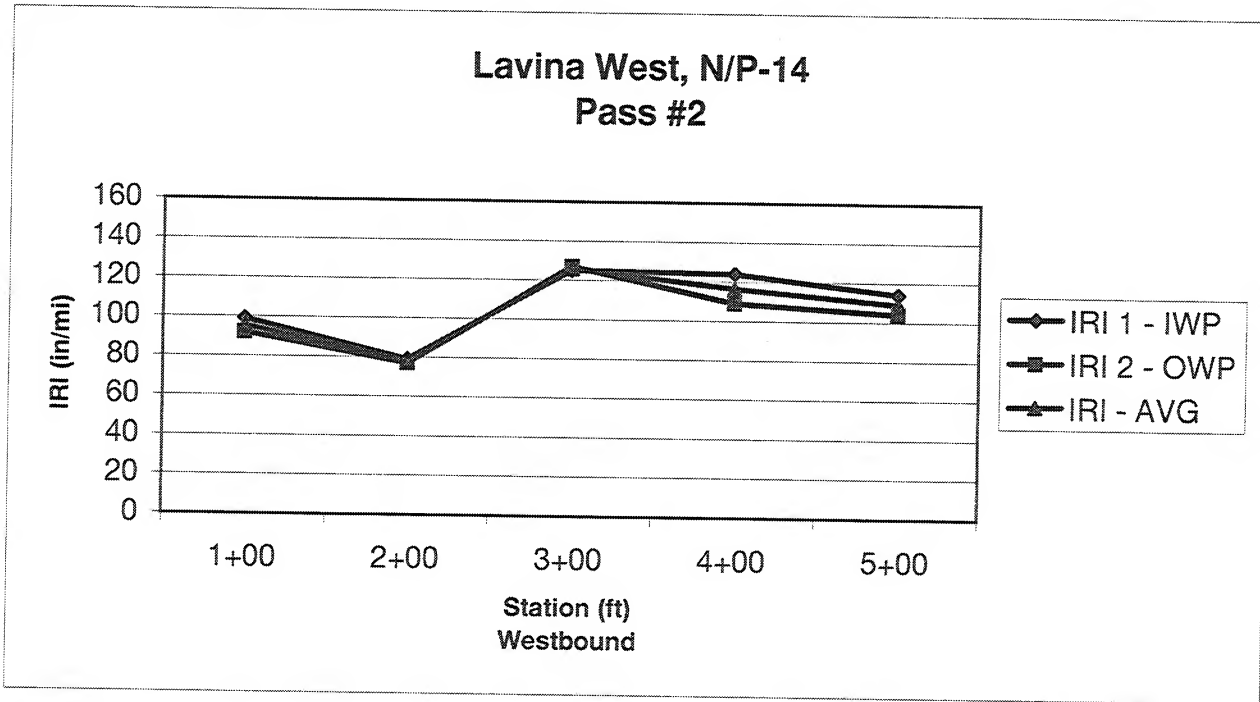
Profile Data

Test Date: 9/27/01

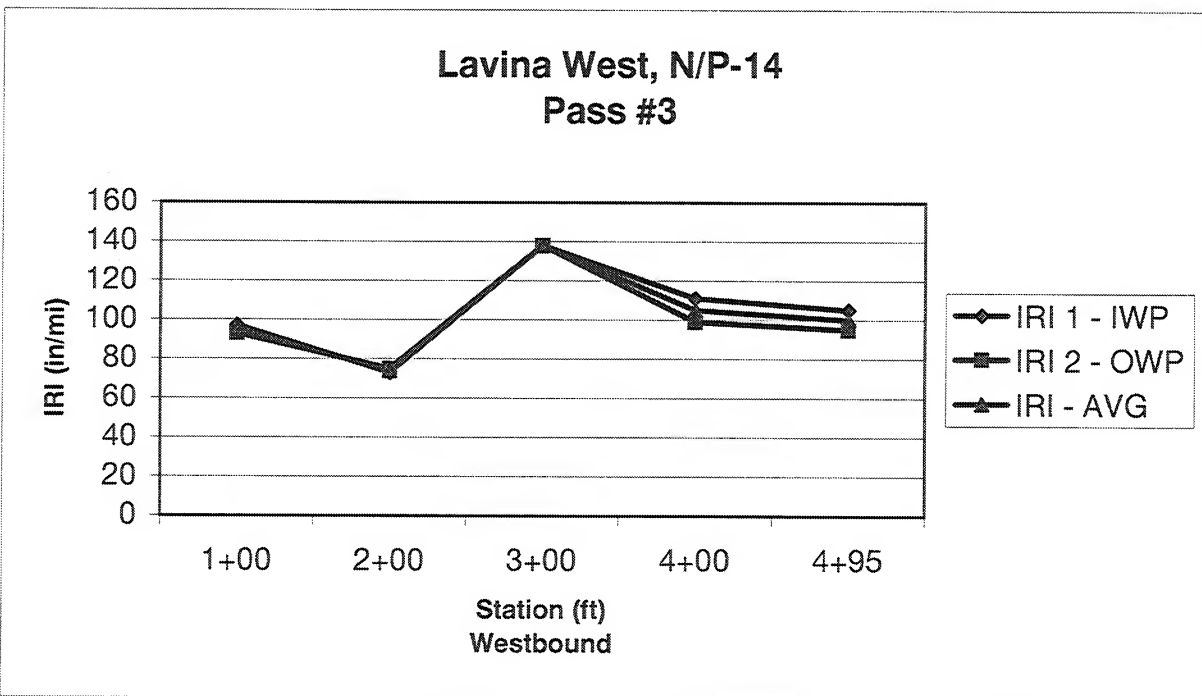
Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.17	0.046	97	93	95
2+00	100	200	100	0.15	0.049	79	81	80
3+00	200	300	100	0.11	0.062	143	127	135
4+00	300	400	100	0.14	0.106	112	123	118
5+00	400	500	100	0.27	0.072	117	86	102
AVG.				0.168	0.067	109.6	102.0	105.8
STD.				0.061	0.024	23.829	21.471	21.156



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.17	0.045	99	92	96
2+00	100	200	100	0.14	0.056	79	77	78
3+00	200	300	100	0.11	0.058	125	127	126
4+00	300	400	100	0.16	0.110	124	109	117
5+00	400	500	100	0.26	0.079	114	104	109
AVG.				0.168	0.070	108.2	101.8	105.0
STD.				0.056	0.026	19.383	18.727	18.765

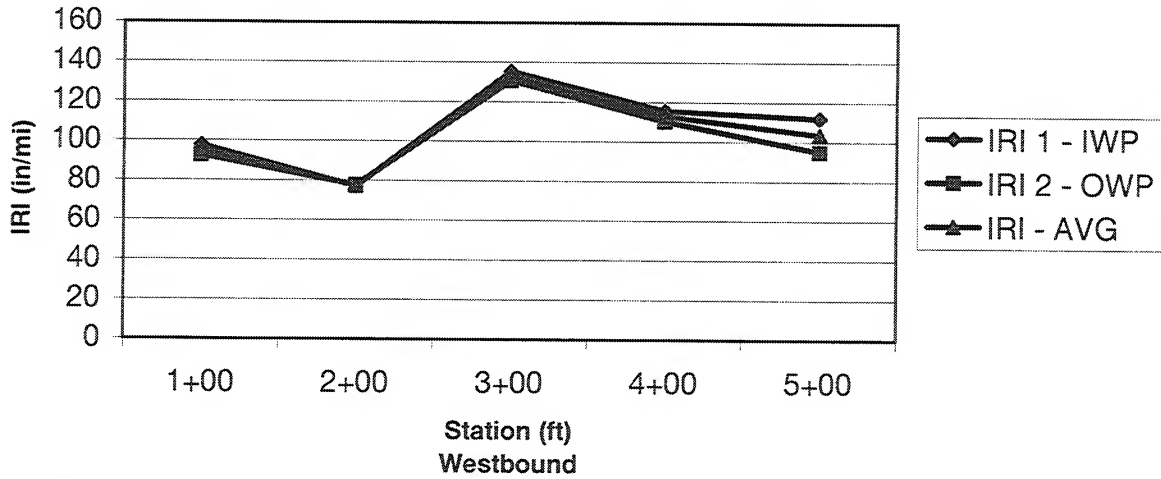


Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.15	0.042	97	93	95
2+00	100	200	100	0.16	0.054	73	75	74
3+00	200	300	100	0.10	0.048	138	138	138
4+00	300	400	100	0.16	0.117	111	99	105
4+95	400	495	95	0.24	0.090	105	95	100
AVG.				0.162	0.070	104.8	100.0	102.4
STD.				0.050	0.032	23.520	23.152	23.137



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.16	0.044	98	93	95
2+00	100	200	100	0.15	0.053	77	78	77
3+00	200	300	100	0.11	0.056	135	131	133
4+00	300	400	100	0.15	0.111	116	110	113
5+00	400	500	100	0.26	0.080	112	95	104
AVG.				0.166	0.069	107.5	101.3	104.4
STD.				0.055	0.027	21.729	20.104	20.680

**Lavina West, N/P-14
average - all passes**



APPENDIX J

GEYSER

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Geyser
 Longitude: 110°28' W
 Latitude: 47°14' N

Pavement Structure

Date: March 2002

Layer #	Material Type	Thickness, in			Comments
		Before	After	Average	
1	ACP	3.9	4.3	4.1	Chip Seal
2	CSB	11.6	11.2	11.4	
3	Base	24.5	26.5	25.5	Brown Clayey-Sandy Gravel
4	Subgrade	-	-	-	Dark Brown Stiff Plastic Clay w/ Some Gravel

Materials Sampling

Date: 5/2/02

Material Type	Quantity	Comments
ACP/CSB	14 cores	2-10" & 12-6" cores
Base	2 bags	
Subgrade	6 bags	

SHRP REGION _____

SHRP-LTPP

STATE CODE _____

STATE MT

FIELD MATERIAL SAMPLING AND FIELD TESTING

LTPP EXPERIMENT Geuser E

ROUTE/HIGHWAY P-57

SHRP ASSIGNED ID _____

SAMPLE/TEST: (a) Before Section ✓ #1 (b) After Section _____

Lane _____ Direction WB

LOG OF SHOULDER PROBE

FIELD SET NO. _____

OPERATOR _____

EQUIPMENT USED _____

SHEET NUMBER 1 OF 1

AUGERING DATE 5-2-02

LOCATION STATION: RP-23 (E. Side)

AUGER PROBE NUMBER _____

TOP OF ROCK BASED ON: _____

OFFSET: _____ feet from $0/s$

NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR.

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
1	3.5"	PMS	
2	15.5"	CTB ^{12"} _✓ Recov'd w/corr	
3	32"	Exstr. Base brn clayey coarse gravel	Split Spins
4	40"	Exstr. Base? brn clayey sand w/ gravel	87 blows
5			16"
6	5.5'	dk brn stiff highly plastic cly some gravel	Sample
7	7.0'	Subgrade	15" - 32"
8			Sample x 2
9		brn sandy gravel	40" - 59"
10		dk brn stiff plastic sandy cly w/ gravel	Sample
11	10.5'		84" - 105"
12	EGH	v coarse gravel / boulders	
13		<u>REFUSAL</u>	
14			
15			
16			
17			
18			
19			
20			

REFUSAL WITHIN 20 FEET (Y/N): Y

DEPTH TO REFUSAL: 10.5' (FEET)

CERTIFIED

VERIFIED AND APPROVED

MONTH-DAY-YEAR

G. Zeihen

 - -19

Crew Chief, Contractor

SHRP Representative

Date

Affiliation: MBT

Affiliation: _____

SHRP REGION _____ STATE CODE _____
 STATE MT FIELD MATERIAL SAMPLING AND FIELD TESTING
 LTPP EXPERIMENT Geuser E ROUTE/HIGHWAY P-57 Lane _____ Direction WR
 SAMPLE/TEST: (a) Before Section _____ (b) After Section #2 FIELD SET NO. _____
 OPERATOR Dan M. LOG OF SHOULDER PROBE DCG SHEET: 08
 AUGERING DATE 5-2-02 EQUIPMENT USED _____ SHEET NUMBER 1 OF 1
 TOP OF ROCK BASED ON: _____ LOCATION STATION: RP-23 (W. Side) AUGER PROBE NUMBER _____
 NOTE: SHOULDER AUGER PROBE IS AN OPTIONAL ITEM, AS DIRECTED BY SAR. OFFSET: _____ feet from °/s

Scale (feet)	Depth from Surface (Feet)	Material Description	Material Code
12	1 4.5"	PMS	
	15.5" - 11"	CTR	
24	2		
36	3 28"	brn sandy clay gravel EXISTO Base	Sample 15.5" - 28"
	35"		Split Spoon
48	4 42"		35" - 53"
	5	brn clay gravel/gravelly clay	39 blows
	6 6'	Subgrade	Sample
	7		44" - 54"
	8	dk brn - brn stiff plast clay	Sample
	9 9'	w/ some coarse sand	78" - 90"
	10		
	11	Coarse gravel, cobbles & boulders	
	12	Refusal	
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		

REFUSAL WITHIN 20 FEET (Y/N): Y DEPTH TO REFUSAL: 9' (FEET)

CERTIFIED G. Zeihen VERIFIED AND APPROVED _____ MONTH-DAY-YEAR _____-____-19____
 Crew Chief, Contractor SHRP Representative Affiliation: _____ Date _____
 Affiliation: MDT Affiliation: _____

**Montana Performance Prediction Models Contract
Field Data Report**

Location: Geyser
 Longitude: 110°28' W
 Latitude: 47°14' N

SHEET 1: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 5/2/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL		
	LOW	MODERATE	HIGH

CRACKING

1	FATIGUE CRACKING (SQUARE METERS)	0.0	0.0	0.0
2	BLOCK CRACKING (SQUARE METERS)	0.0	0.0	0.0
3	EDGE CRACKING (METERS)	0.0	0.0	0.0
4	LONGITUDINAL CRACKING			
	4a. Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
	4b. Non-Wheelpath (Meters)	0.0	0.0	0.0
	Length Sealed (Meters)	0.0	0.0	0.0
5	REFLECTION CRACKING AT JOINTS	Not Recorded		
6	TRANSVERSE CRACKING			
	Number of Cracks	0	0	0
	Length (Meters)	0.0	0.0	0.0
	Length Sealed	0.0	0.0	0.0

PATCHING AND POTHOLES

7	PATCH / PATCH DETERIORATION (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0
8	Potholes (Number)	0	0	0
	(Square Meters)	0.0	0.0	0.0

Location: Geyser
 Longitude: 110°28' W
 Latitude: 47°14' N

SHEET 2: DISTRESS SURVEY

DATE OF DISTRESS SURVEY (MONTH/DAY/YEAR) 5/2/02
 SURVEYOR 1: WT SURVEYOR 2: BS

DISTRESS TYPE	SEVERITY LEVEL
	N/A

SURFACE DEFORMATION

9	RUTTING - REFER TO PROFILE DATA	
10	SHOVING (Number)	0
	(Square Meters)	0.0

SURFACE DEFECTS

11	BLEEDING (Square Meters)	0.0
12	POLISHED AGGREGATE (Square Meters)	0.0
13	RAVELING (Square Meters)	0.0

MISCELLANEOUS DISTRESSES

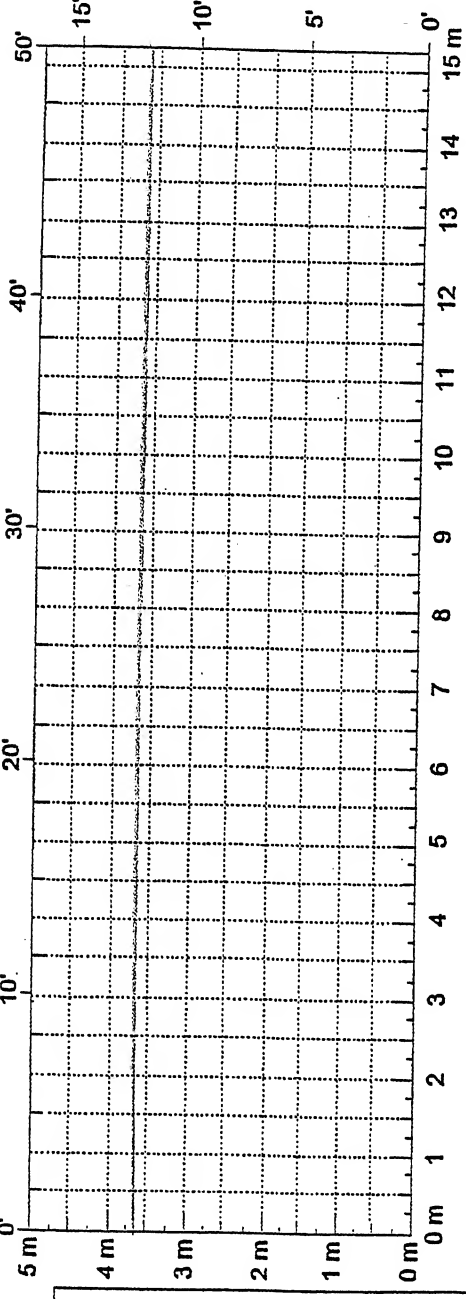
14	LANE-TO-SHOULDER DROPOFF - Not Recorded	
15	WATER BLEEDING AND PUMPING (Number)	0
	Length of Affected Pavement (Meters)	0.0
16	OTHER (Describe) <u>No distress, chip sealed on Spring 2001</u> the only distress.	

State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Pavement Temp:
 Before _____ After _____

Surveyors: LT/BS
 Date: 5/2/02

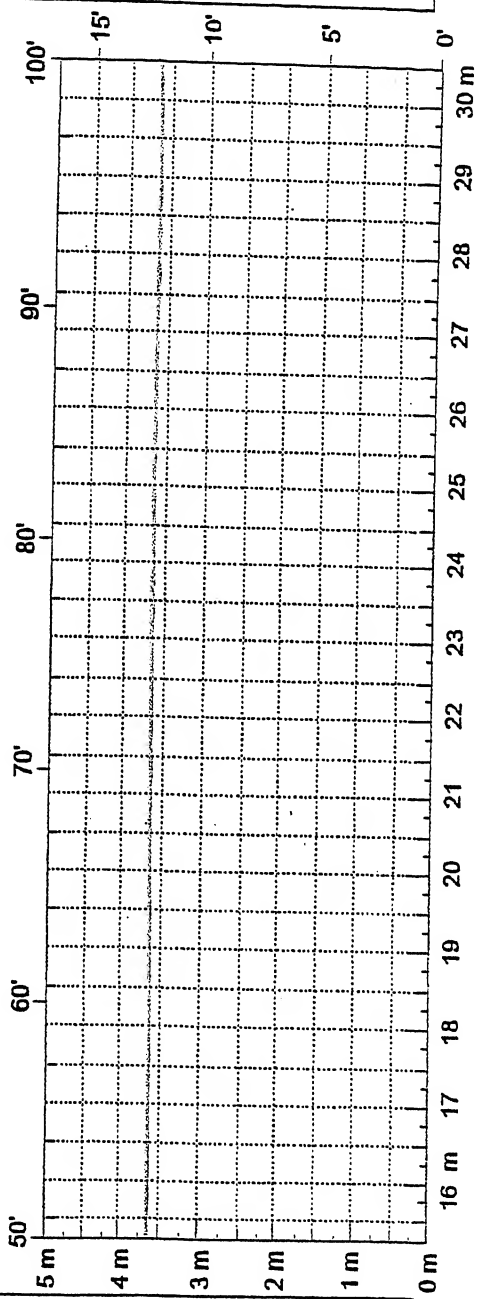
Reviewer: _____
 Date: _____



Section Summary

No distress.

Comments: _____



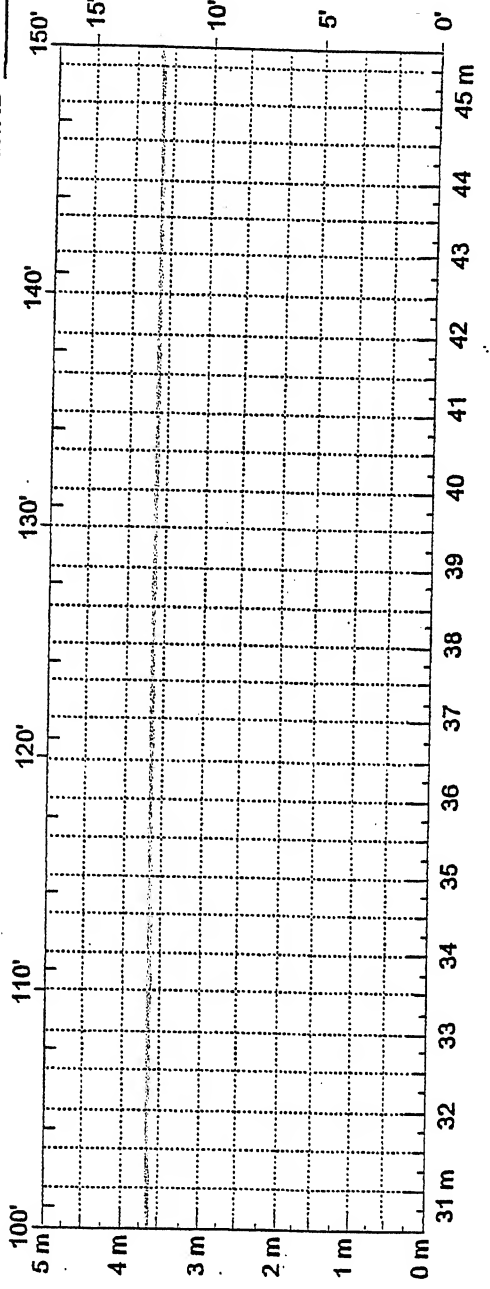
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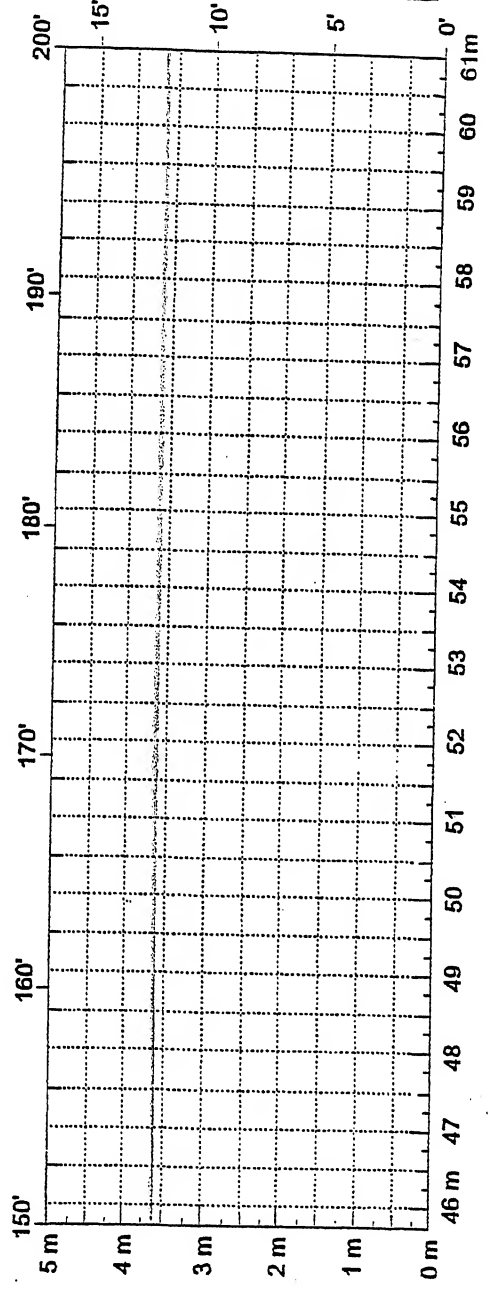
Comments: _____

State Assigned ID _____
State Code _____
SHRP Section ID _____

Reviewer: _____
Date: _____
Surveyors: WT/BS
Date: 5/2/82

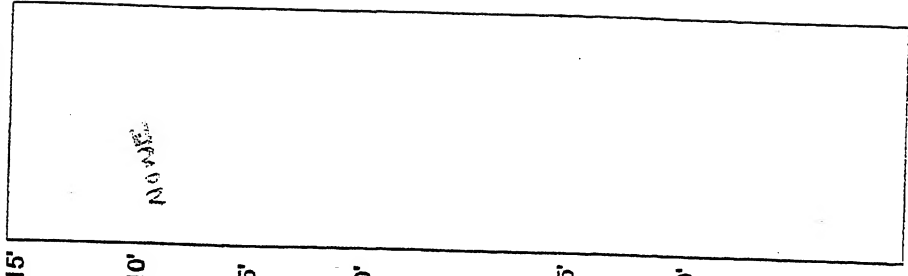


Comments: _____



Comments: _____

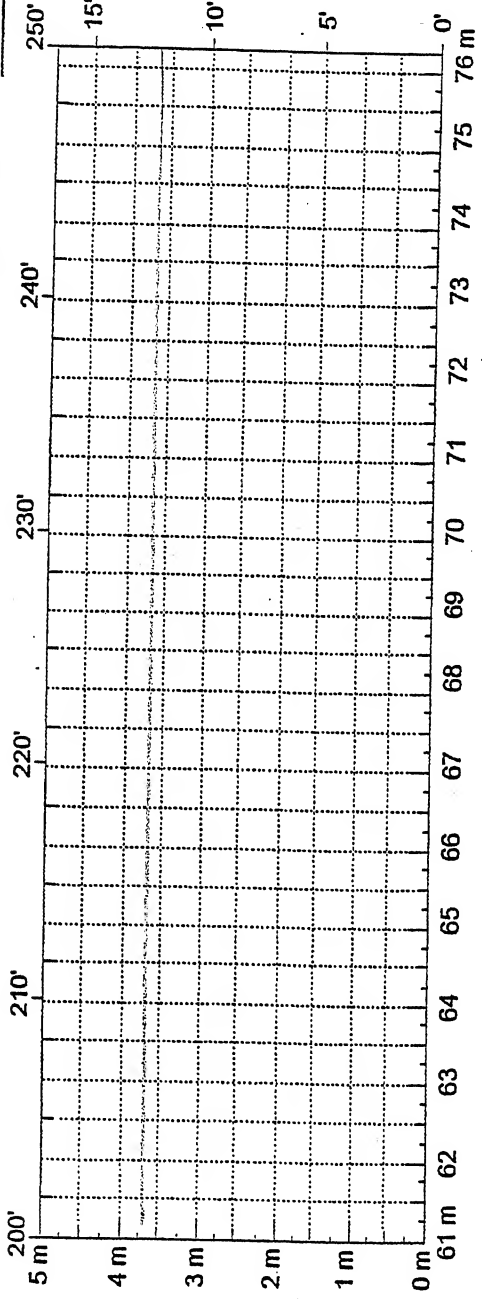
Sheet Summary



State Assigned ID _____
State Code _____
SHRP Section ID _____

Reviewer: _____
Date: _____

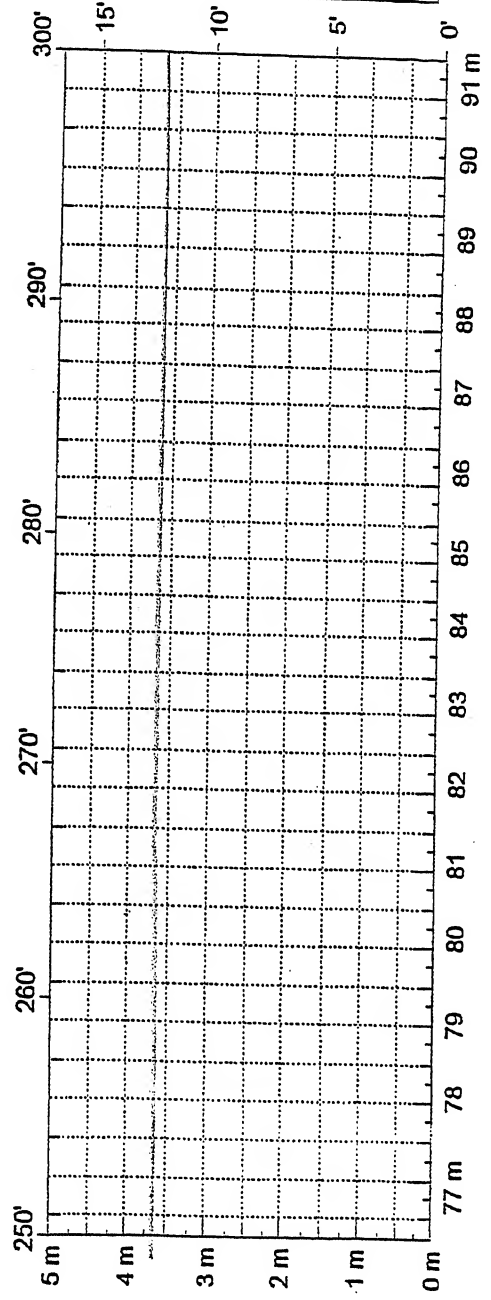
Surveyors: AT BS
Date: 5/2/02



Comments: _____

Sheet Summary

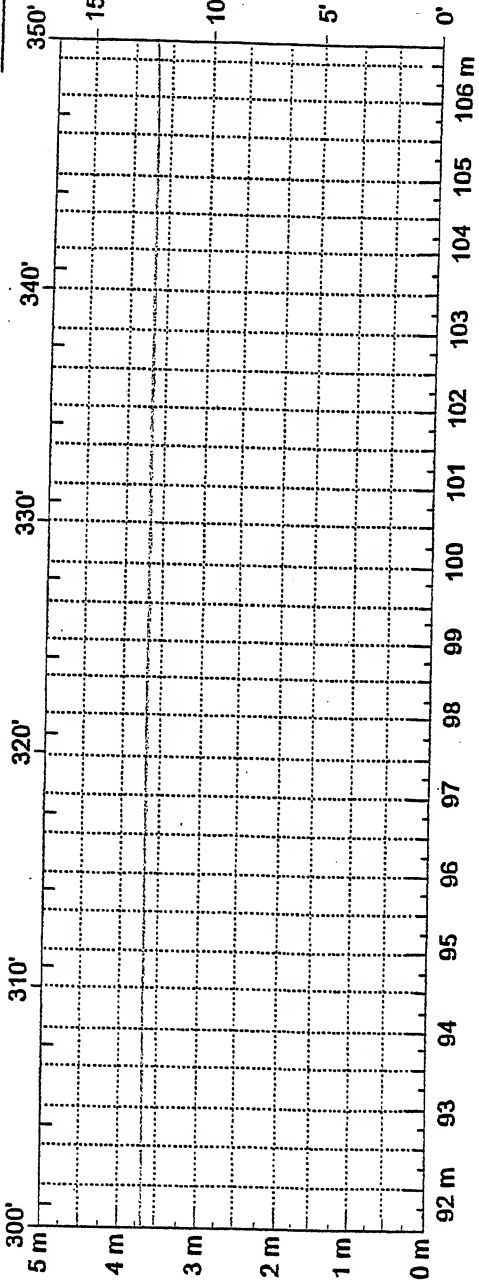
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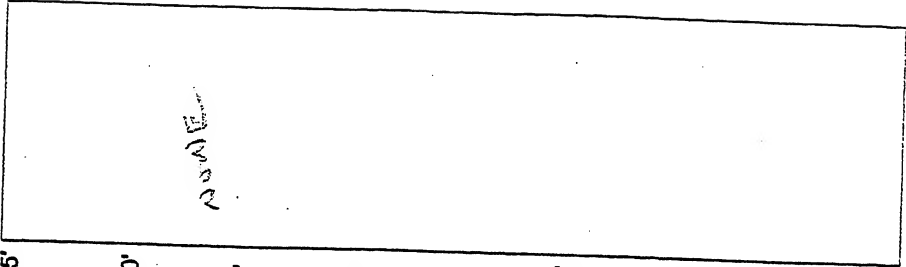
Comments: _____

State Assigned ID _____
State Code _____
SHRP Section ID _____

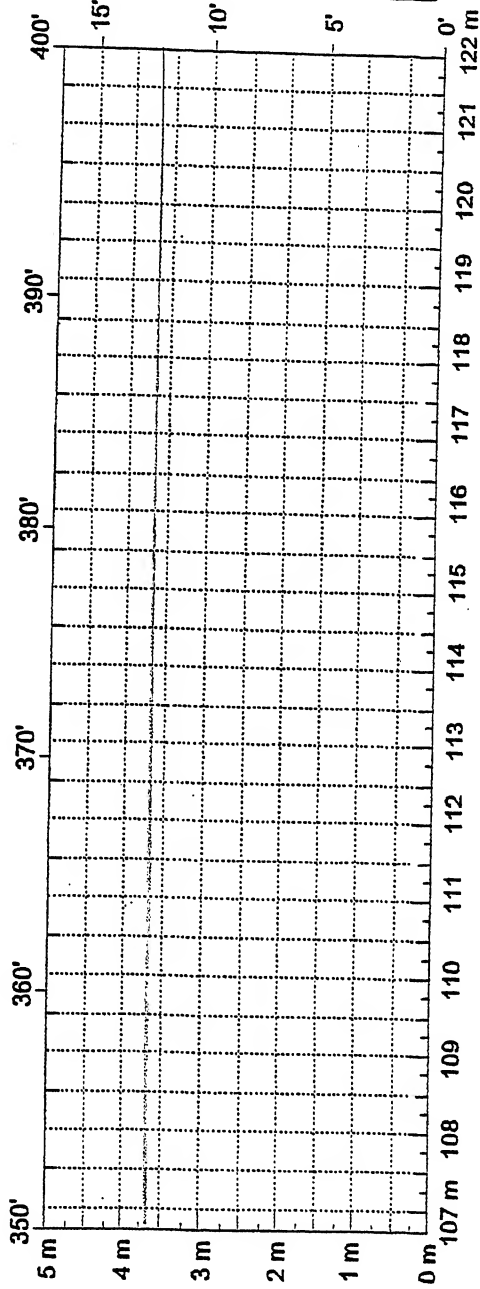
Reviewer: _____
Date: _____
Surveyors: AT/BS
Date: 5/1/02



Sheet Summary



Comments: _____

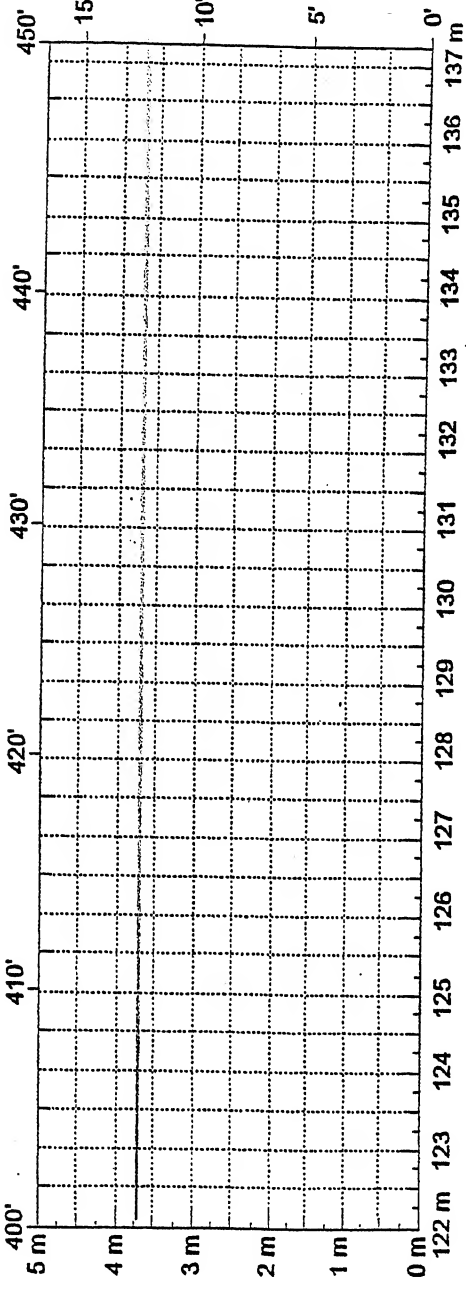


Comments: _____

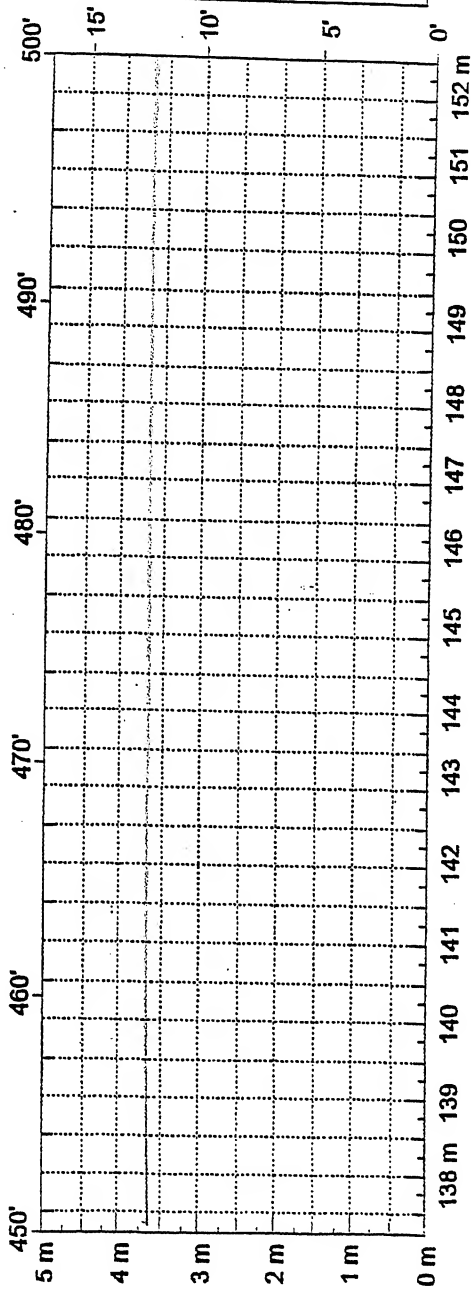
State Assigned ID _____
 State Code _____
 SHRP Section ID _____

Pavement Temp: _____
 After _____

Reviewer: _____
 Date: 5/2/02
 Surveyors: ST (M)

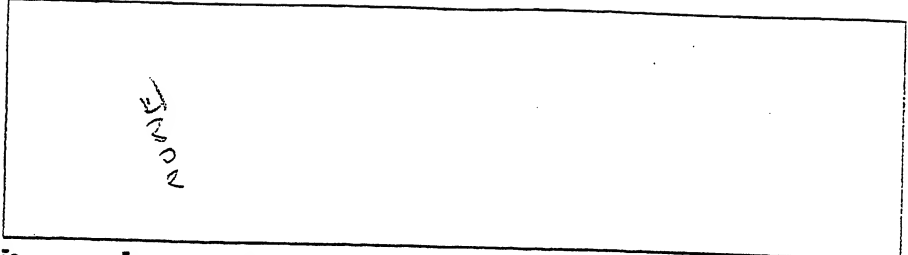


Comments: _____



Comments: _____

Sheet Summary



**Montana Performance Prediction Models Contract
Field Data Report**

Location: Geyser
 Longitude: 110°28' W
 Latitude: 47°14' N

FWD Data

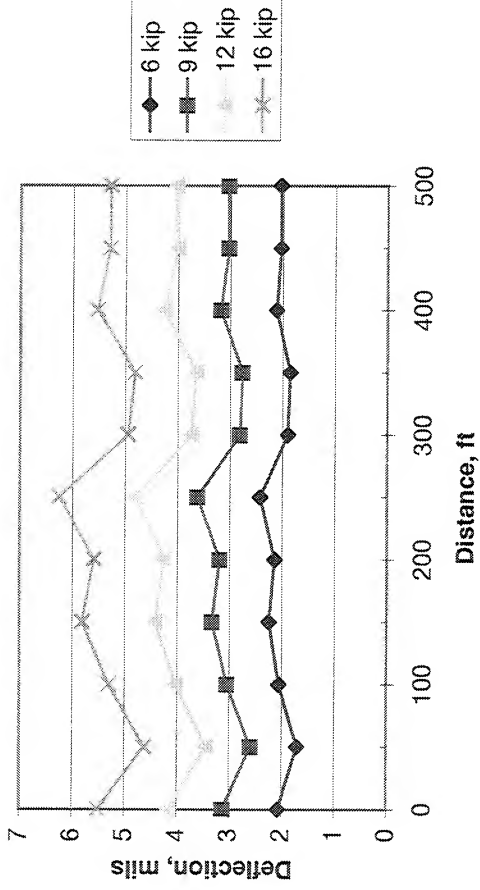
Test Date: 10/10/01

Layer	Material Type	Average Thickness in.
1	ACP	4.1
2	CSB	11.4
3	Base	25.5
4	Subgrade	-

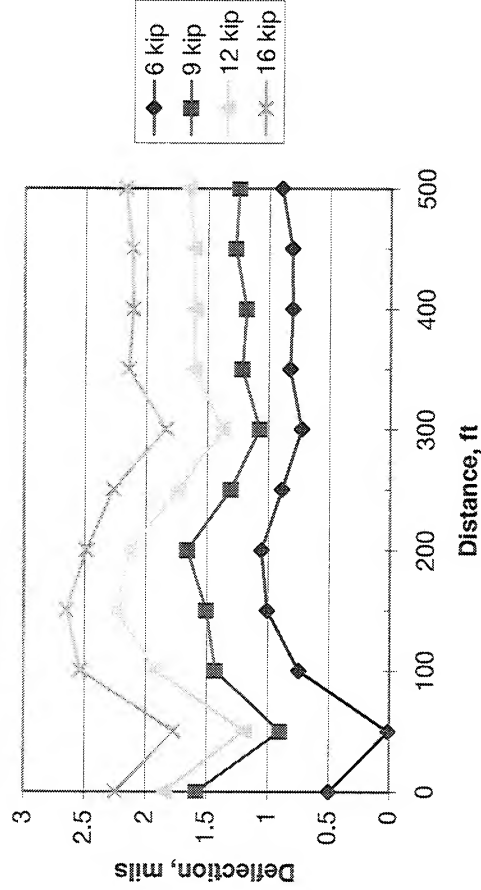
Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
0+00	6.53	2.25	1.99	1.89	1.79	1.47	0.97	0.54
0+00	8.98	3.12	2.79	2.54	2.29	2.07	1.82	1.58
0+00	11.47	3.98	3.56	3.26	2.92	2.62	2.04	1.76
0+00	15.33	5.28	4.78	4.36	3.88	3.50	2.74	2.15
0+50	6.47	1.84	0.04	0.03	0.01	0.00	0.01	0.01
0+50	8.84	2.55	2.16	1.98	1.75	1.56	1.20	0.88
0+50	11.49	3.30	2.83	2.59	2.28	2.05	1.56	1.14
0+50	15.46	4.47	3.80	3.49	3.05	2.75	2.06	1.71
1+00	7.80	2.67	2.37	2.41	2.34	1.82	1.36	0.97
1+00	10.08	3.41	3.03	2.84	2.66	2.40	1.97	1.60
1+00	12.15	4.08	3.66	3.45	3.22	2.88	2.39	1.94
1+00	14.78	4.90	4.41	4.12	3.83	3.47	2.85	2.34
1+50	7.80	2.92	2.68	2.53	2.30	2.05	1.64	1.31
1+50	10.05	3.72	3.42	3.22	2.94	2.62	2.13	1.68
1+50	12.15	4.47	4.11	3.88	3.57	3.17	2.53	2.27
1+50	14.87	5.40	4.98	4.69	4.27	3.81	3.06	2.46
2+00	7.79	2.78	2.42	2.26	2.05	1.96	1.69	1.37
2+00	10.03	3.56	3.12	2.89	2.67	2.43	2.10	1.85
2+00	12.17	4.31	3.78	3.48	3.23	2.92	2.39	2.16
2+00	14.73	5.14	4.55	4.17	3.83	3.53	2.81	2.29
2+50	7.86	3.17	2.67	2.42	2.14	1.89	1.45	1.16
2+50	10.05	4.04	3.41	3.08	2.74	2.43	1.91	1.46
2+50	12.12	4.83	4.08	3.68	3.29	2.93	2.29	1.75
2+50	14.74	5.76	4.92	4.45	3.90	3.50	2.71	2.09

Station ft	Load kips	Deflection 1 mils	Deflection 2 mils	Deflection 3 mils	Deflection 4 mils	Deflection 5 mils	Deflection 6 mils	Deflection 7 mils
3+00	7.77	2.46	2.12	1.96	1.79	1.66	1.20	0.94
3+00	10.07	3.14	2.73	2.54	2.34	2.07	1.51	1.20
3+00	12.17	3.78	3.30	3.03	2.76	2.53	1.81	1.39
3+00	14.73	4.55	3.97	3.66	3.36	3.03	2.17	1.69
3+50	7.86	2.43	2.13	1.93	1.77	1.62	1.33	1.08
3+50	9.99	3.07	2.70	2.51	2.30	2.06	1.69	1.35
3+50	12.15	3.69	3.25	3.02	2.72	2.49	2.06	1.63
3+50	14.78	4.44	3.96	3.67	3.30	3.01	2.47	1.98
4+00	7.85	2.77	2.33	2.15	1.93	1.70	1.33	1.05
4+00	10.04	3.55	2.98	2.73	2.48	2.16	1.71	1.32
4+00	12.07	4.27	3.59	3.30	2.92	2.61	2.05	1.61
4+00	14.78	5.11	4.36	4.01	3.52	3.15	2.46	1.95
4+50	7.86	2.67	2.31	2.08	1.87	1.67	1.33	1.06
4+50	10.03	3.38	2.91	2.60	2.36	2.08	1.71	1.42
4+50	12.08	4.03	3.49	3.16	2.83	2.53	2.02	1.62
4+50	14.75	4.88	4.19	3.79	3.37	3.03	2.45	1.95
5+00	7.79	2.65	2.28	2.08	1.86	1.68	1.40	1.16
5+00	10.04	3.39	2.90	2.63	2.39	2.15	1.73	1.39
5+00	12.11	4.06	3.47	3.16	2.90	2.60	2.14	1.67
5+00	14.80	4.89	4.25	3.80	3.45	3.11	2.55	2.01

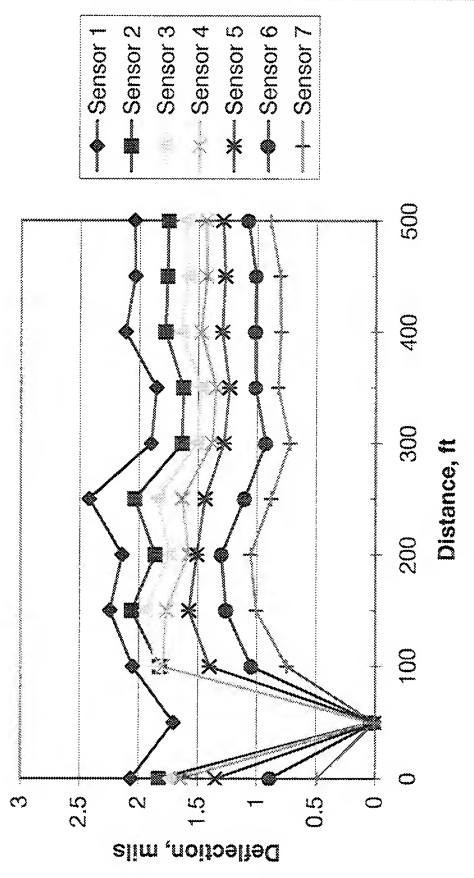
Geyser, Sensor 1 Deflections



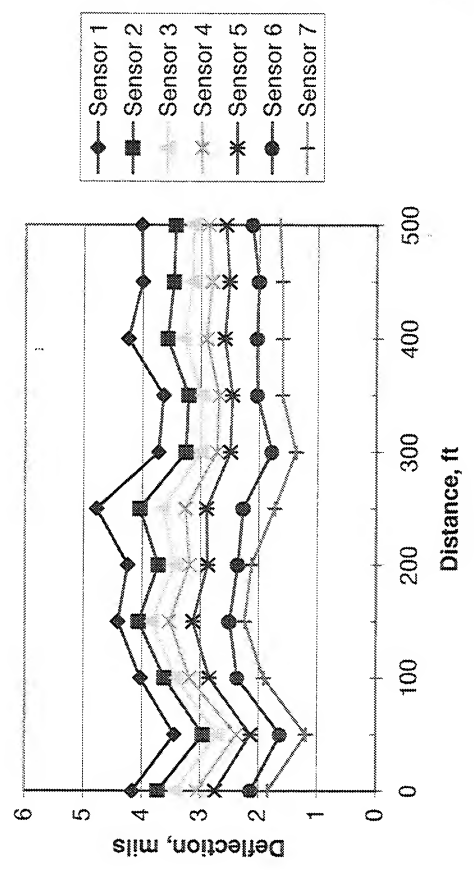
Geyser, Sensor 7 Deflections



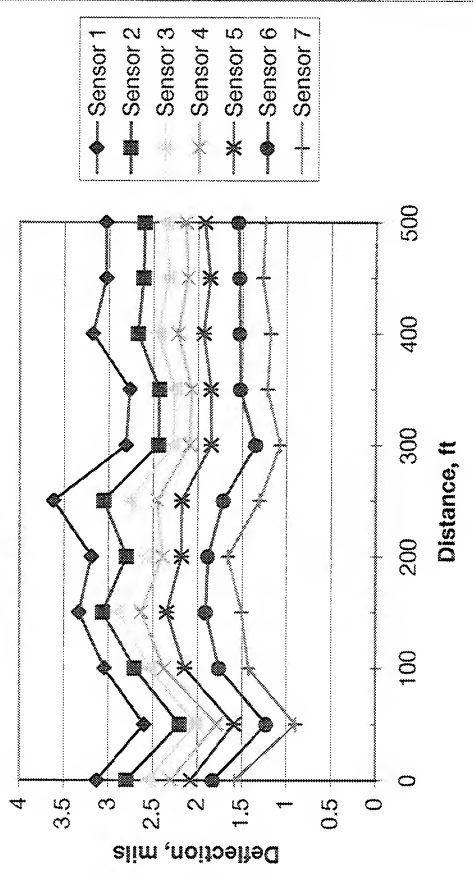
Geyser, 6,000-lb Load



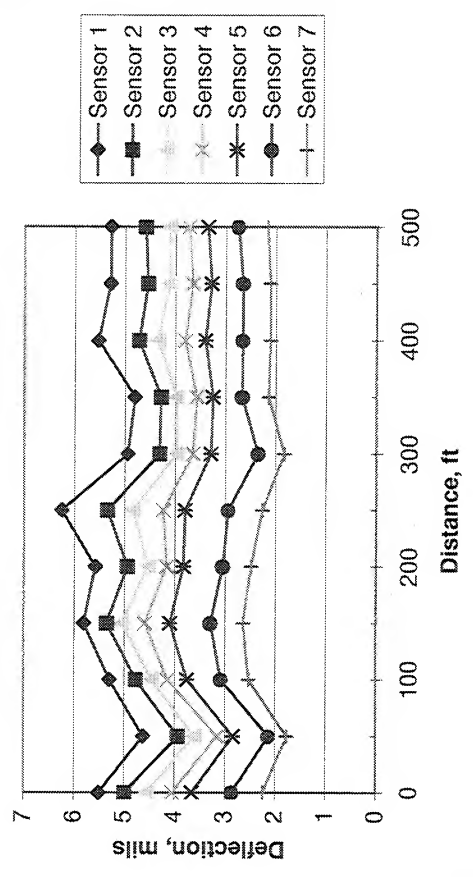
Geyser, 12,000-lb Load



Geyser, 9,000-lb Load



Geyser, 16,000-lb Load



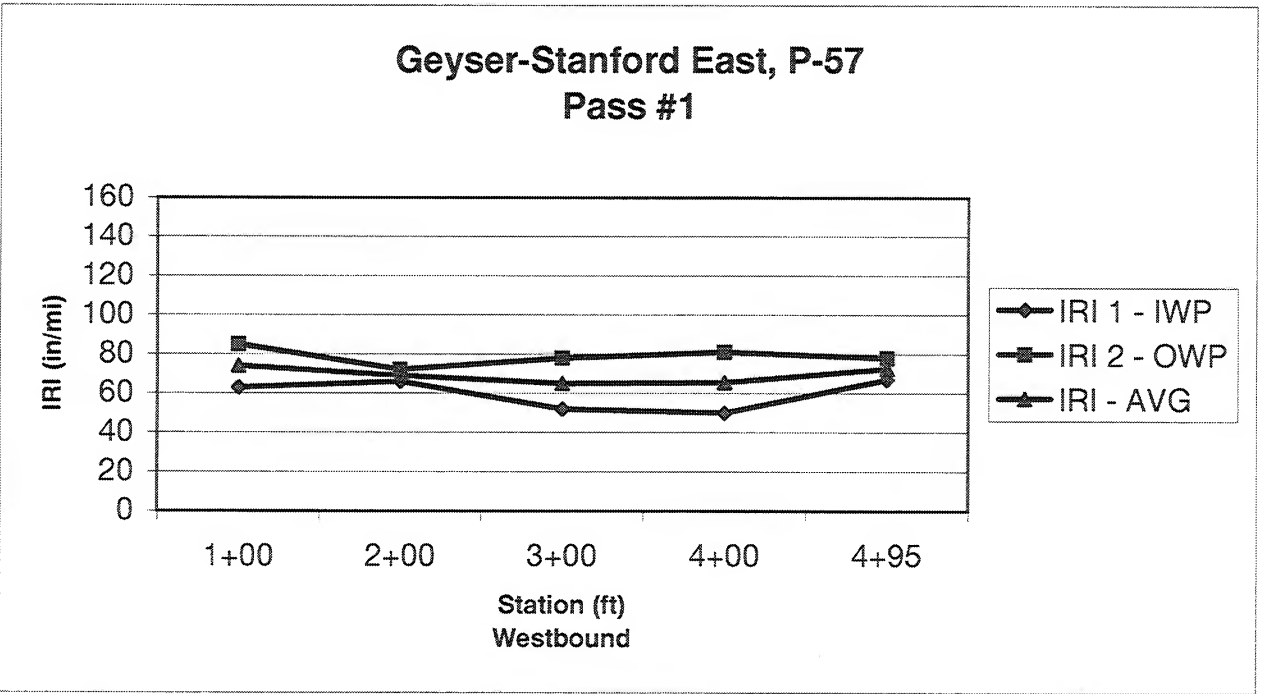
**Montana Performance Prediction Models Contract
Field Data Report**

Location: Geyser
 Longitude: 110°28' W
 Latitude: 47°14' N

Profile Data

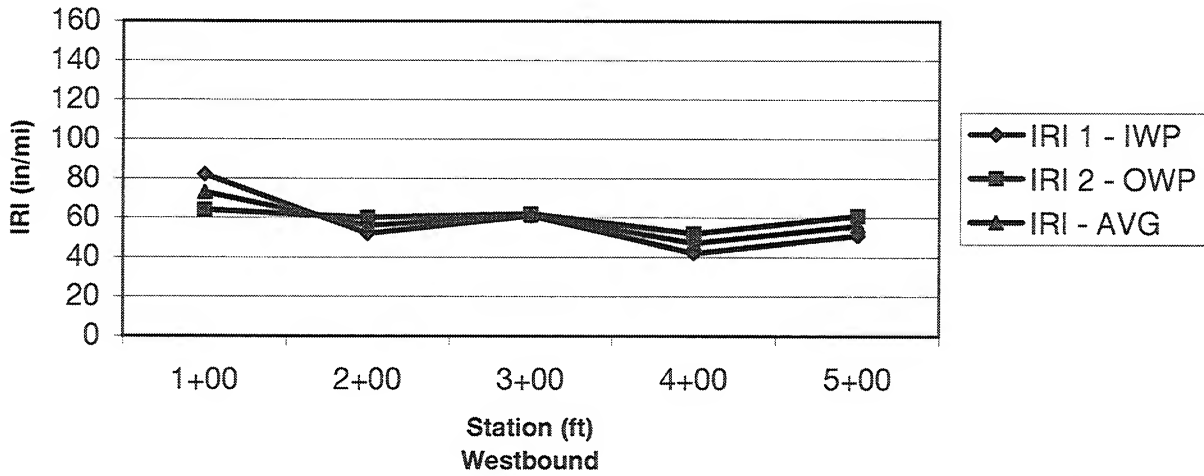
Test Date: 9/25/01

Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.01	0.010	63	85	74
2+00	100	200	100	0.02	0.013	66	72	69
3+00	200	300	100	0.01	0.009	52	78	65
4+00	300	400	100	0.02	0.014	50	81	66
4+95	400	495	95	0.02	0.012	67	78	73
AVG.				0.016	0.012	59.6	78.8	69.2
STD.				0.005	0.002	8.019	4.764	4.040



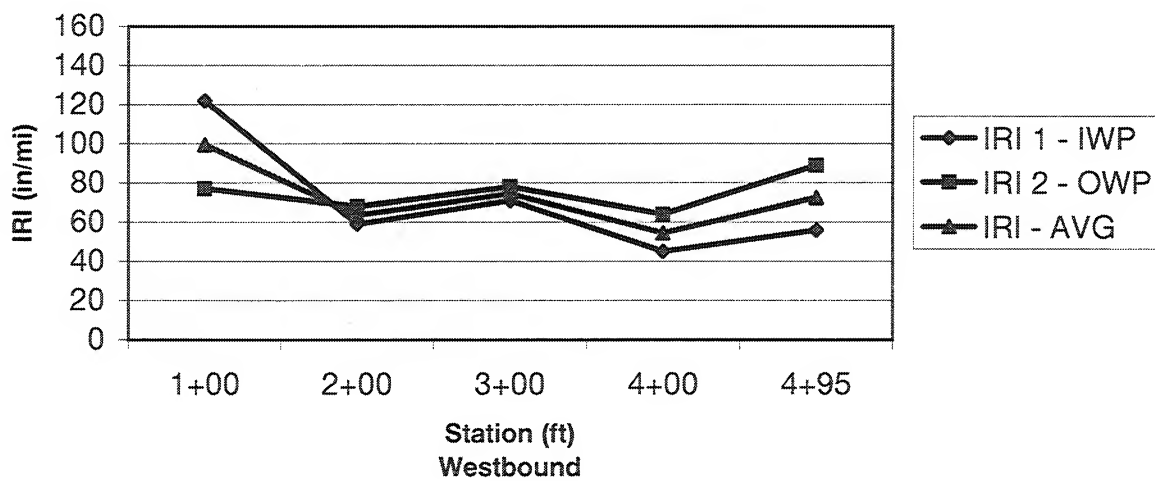
Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.		in./mi.		
1+00	0	100	100	0.01	0.009	82	64	73
2+00	100	200	100	0.01	0.011	52	60	56
3+00	200	300	100	0.02	0.011	61	62	62
4+00	300	400	100	0.00	0.000	42	52	47
5+00	400	500	100	0.01	0.010	51	61	56
AVG.				0.010	0.008	57.6	59.8	58.7
STD.				0.007	0.005	15.209	4.604	9.537

**Geyser-Stanford East, P-57
Pass #2**



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.		ft.	in.		in./mi.		
1+00	0	100	100	0.01	0.010	122	77	100
2+00	100	200	100	0.00	0.001	59	68	64
3+00	200	300	100	0.01	0.008	71	78	75
4+00	300	400	100	0.01	0.008	45	64	55
4+95	400	495	95	0.01	0.011	56	89	73
AVG.				0.008	0.008	70.6	75.2	72.9
STD.				0.004	0.004	30.188	9.731	16.861

**Geyser-Stanford East, P-57
Pass #3**



Station	From	To	Length	Rut Depth Average	Rut Depth Std.Dev.	IWP IRI	OWP IRI	AVG. IRI
ft.	ft.	ft.	ft.	in.	in.	in./mi.		
1+00	0	100	100	0.01	0.010	89	75	82
2+00	100	200	100	0.01	0.008	59	67	63
3+00	200	300	100	0.01	0.009	61	73	67
4+00	300	400	100	0.01	0.007	46	66	56
5+00	400	500	100	0.01	0.011	58	76	67
AVG.				0.011	0.009	62.6	71.3	66.9
STD.				0.002	0.001	15.964	4.833	9.693

Geyser-Stanford East, P-57
average - all passes

